HANSENYUNCKEN

Construction Environmental Management Plan

Project: Newcastle High School Redevelopment

Job No: SN111

Rev: 1 | Jan 2024

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Hansen Yuncken would like to acknowledge the AWABAKAL people as the traditional custodians of the land where this project is located.

We honour elders; past, present and emerging whose knowledge and wisdom has and will ensure continuation of cultures and traditional practices.

EMP Preparation Checklist – Condition B13 & 14 – CEMP

Requirement	Plan Reference	Yes/No/Not Applicable
Document preparation and endorsement		
Has the EMP been prepared in consultation with all relevant stakeholders as per the requirements of the conditions of consent?	A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP) & Construction Flood Emergency Plan	Yes
Have the views of the relevant stakeholders been taken into consideration? Have appropriate amendments been made to the EMP and does the EMP clearly identify the location of any changes?	Section 5 mitigation strategies reflect sub-plans	Yes
Has the EMP been internally approved by an authorised representative of the proponent or contractor?	CEMP to be approved under Section 1.1	Yes
The EMP has been prepared in regards to the relevant guidelines, including but not limited to the Environmental Management Plan Guideline: Guideline for Infrastructure Projects (DPIE April 2020).	Section 4.4 Policy Objectives	Yes
Version and content		
Does the EMP describe the proponent's Environmental Management System (EMS) (if any), and identify how the EMP relates to other documents required by the conditions of consent?	Section 4.3 Appendix A.2	Yes
Does the EMP include the required general content and version control information?	Section 1.2 A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP) – Document Control sections in sub-plans	Yes
Does the EMP have an introduction that describes the project, scope of works, site location and any staging or timing considerations?	Sections 4.1, 4.2 & 4.2.1	Yes
Does the EMP reference the project description?	Sections 4.2 & 5.4 A.3 & A.14	Yes
Does the EMP reference a Community and Stakeholder Engagement Plan (or similar) or include community and stakeholder engagement actions (if required)?	Section 5.18	Yes

Requirement	Plan Reference	Yes/No/Not Applicable
Have all other relevant approvals been identified? Has appropriate information been provided regarding how each approval is relevant?	Section 1.1 A.5 (CTPMSP) & A.8 (CSWMSP)	Yes
Has the environmental management structure and responsibilities been included?	Sections 4.8 & 5.3	Yes
Does the EMP include processes for training of project personnel and identify how training and awareness needs will be identified?	Sections 4.4 & 5.1	Yes
Does the EMP clearly identify the relevant legal and compliance requirements that relate to the EMP?	Section 4.7.3 A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP) – Relevant compliance, legislative requirements, criterion, etc. identified in sub-plans	Yes
Does the EMP include all the conditions of consent to be addressed by the EMP and identify where in the EMP each requirement has been addressed?	Section 3	Yes
Have all relevant guidelines, policies and standards been identified, including details of how they are relevant?	Section 4.7.3 A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP) – Relevant guidelines, policies and standards identified in sub-plans	Yes
Is the process that will be adopted to identify and analyse the environmental risks included?	Sections 5.3 & 6	Yes
Have all the environmental management measures in the EIA been directly reproduced into the EMP?	Section 5 A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP) – Management/ mitigation measures outlined in sub-plans	Yes
Have any additional environmental management measures been included in the EMP?	Section 6	Yes
Have environmental management measures been written in committed language?	Section 5	Yes

Requirement	Plan Reference	Yes/No/Not Applicable
Have project environmental management measures, including hold points, been identified and included?	Section 4.9	Yes
Are relevant details of environmental monitoring that will be carried out included?	Section 5.5.2 & 5.12.5	Yes
Have the components of any environmental monitoring programs been incorporated?	A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP) – Monitoring, recording and reporting requirements outlined in sub-plans	Yes
Are environmental inspections included?	Section 6.2	Yes
Does the EMP document all relevant compliance monitoring and reporting requirements for the project?	Section 6.2.2	Yes
Does the EMP describe the types of plans or maps (such as environmental control maps) that will be used to assist with the management of environmental matters on site?	A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP) – Environmental control plans provided in sub-plans	Yes
Does the EMP list environmental management documents?	A.2, A.4, A.5 (CTPMSP), A.6 (CNVMSP), A.7 (CWMSP), A.8 (CSWMSP), A.9 (ACHMSP), A.10 (CHMSP), A.11, A.12 & A.15	Yes
Is an auditing program referenced?	Section 6.2	Yes
Does the EMP include the incident notification and reporting protocols that comply with the relevant conditions of consent?	Section 6	Yes
Does the EMP identify the project role/position that is responsible for deciding whether an occurrence is an incident?	Sections 4.8 & 6	Yes
Does the EMP describe a corrective and preventative action process that addresses the requirements?	Sections 6.2.1 & 6.2.2	Yes
Does the EMP include details of a review and revision process that complies with the requirements?	Sections 1 & 4.4	Yes

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1 Document Information

1.1 Review & Approval

Position	Name	Sign	Date
Review			
Project Manager	Robert Petersen		
Site Manager	Chris Histon		
Contracts Administrator	Michael Pratt		
Contracts Administrator			
Project Engineer	Jordan Watters		
Project Engineer	Giuseppe Carlomagno		
Site Engineer			
Site Supervisor			
Site Supervisor			
Cadet			
HSE Coordinator			
Leading Hand			
Approval			
State HSE Manager			
Regional NSW Manager			

1.2 Change Information

Change Information			
Revision	**Description**	**Issued by**	**Issue date**
1	Project Commencement	JW	12/01/24

2 Definitions

The following definitions and abbreviations have been used in this Environmental Management Plan. Further definitions and abbreviations are provided in referenced procedures and plans.

BIM360 Field	Cloud based QHSE field management software application designed specifically for the construction industry.
EMP	Environmental Management Plan (this document)
EPA	State Environment Protection Authority
ESD	Ecologically Sustainable Development
HSE	Health, Safety & Environment
HY	Hansen Yuncken Pty Ltd
HYWAY	An information management platform developed by HY utilising Microsoft SharePoint
NC	Non-Conformance
NGER	National Greenhouse and Energy Reporting
NHSR	Newcastle High School Redevelopment
NVMP	Noise and Vibration Management Plan
OEH	Office of Environment and Heritage
PLN	HY Plan
PMP	Project Management Plan
POEO	The Protection of the Environment Operations Act
PROJ	Project Management
REO	Regional Environmental Officer
RMS	Roads and Maritime Services
S/C	Subcontract(s) or Subcontractor(s) as the context requires
Site Safety Supervisor	Site Manager
SSC	Site Safety Coordinator
SSO	Site Safety Advisor
Superintendent	APP
SWMS	Safe Work Method Statement
TMP	Traffic Management Plan

3 Compliance with SSD-41814831 Conditions

Condition ID	Requirement	Reference
B13	Management plans required under this consent must be prepared having regard to the relevant guidelines, including but not limited to the Environmental Management Plan Guideline: Guideline for Infrastructure Projects (DPIE April 2020).	4.1
B14	Prior to commencement of construction and demolition of internal roadways, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary for information. The CEMP must include, but not be limited to, the following:	
B14(a)	(a) Details of:	
B14(a)(i)	(i) hours of work	4.2.1
B14 (a)(ii)	(ii) 24-hour contact details of site manager	4.2.2
B14 (a)(iii)	(iii) management of dust and odour to protect the amenity of the neighbourhood	5.7
B14 (a)(iv)	(iv) external lighting in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting	5.17 & A.13
B14 (a)(vi)	(v) community consultation and complaints handling as set out in the Community Communication Strategy required by condition B9	5.18
B14 (b)	(b) An unexpected finds protocol for contamination and associated communications procedure to ensure that potentially contaminated material is appropriately managed	5.11.8
B14 (c)	(c) An unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure	5.11.8
B14 (d)	(i) Construction Traffic and Pedestrian Management Sub-Plan (see condition B15)	A.5
B14 (e)	(ii) Construction Noise and Vibration Management Sub-Plan (see condition B16)	A.6
B14 (f)	(iii) Construction Waste Management Sub-Plan (see condition B17)	A.7
B14 (g)	(iv) Construction Soil and Water Management Sub-Plan (see condition B18)	A.8
B14 (h)	(v) Aboriginal Cultural Heritage Management Sub-Plan (see condition B19)	A.9
B14 (i)	(vi) Cultural Heritage Management Sub-Plan (see condition B20)	A.10
B14 (j)	(vii) Construction Flood Emergency Management Plan (see condition B21)	A.11

For all SSD-41814831 Consent Conditions, refer to Appendix A.14

4 Commitment & Policy

4.1 Scope & Application

The Construction Environmental Management Plan (CEMP) has been developed to demonstrate that the proposed Works will be executed in accordance with legislated safety and environmental requirements with minimal inconvenience to stakeholders including neighbours and the general public.

Hansen Yuncken, appointed as Principal Contractor in accordance with NSW WHS legislation, complies with the requirements detailed in this Construction Environmental Management Plan, as well as the requirements of any other legislation or statutory bodies.

The proposed development includes the design and construction of a Core 21 Primary School inclusive of; learning spaces, ancillary & sport spaces, hall, library, administration facilities, canteen, special programs space and unique areas. It also includes the design and construction of a Stream 2 High School inclusive of; general and specialist learning spaces, ancillary & sport spaces, library, administration facilities, canteen, indoor multi-purpose court and outdoor landscaped areas.

A combination of offsite and onsite construction techniques will be used to deliver a high quality, future focused innovative, state of the art school. Meeting the current and future school and community needs whilst complying with the requirements as detailed in the Educational Facilities Standards and Guidelines (EFSG) and providing a high level of end user satisfaction.

This CEMP has been generated to satisfy the requirements of “ISO 14001:2015, Environmental management systems – Requirements with guidance for use” and the “NSW Government Environmental Management System Guidelines – 3rd edition”. It establishes guidelines and controls for all HY activities that may impact the surrounding environment for the duration of the works, including but not limited to, air, water, land, natural resource use & waste, flora & fauna, and their respective interrelationship. Furthermore, it has been designed to embrace the environmental management requirements, both in terms of the Contract and generally, to demonstrate HY as an environmentally responsible organisation to the broader community.

In preparing this CEMP Hansen Yuncken consider that the intent of the Environmental Management Plan Guideline: Guideline for Infrastructure Projects (DPIE April 2020) have been met.

4.2 Project Description

Newcastle High School Redevelopment is a live, heritage listed school site located on Awabakal Land in Hamilton South, Newcastle. The project provides major upgrades to the existing school infrastructure to support the growing population in the region. The project works include;

- Demolition of eight (8) buildings
- Services infrastructure upgrades
- Relocation of Building H

- Construction of a new three (3) storey learning hub on the southwestern corner of the campus, incorporating a new library, canteen, covered outdoor learning area (COLA), support learning unit, general learning spaces, hospitality teach spaces, and science labs
- Construction of a new multi-purpose facility on the north-eastern corner of the campus, incorporating a gymnasium, stage, fitness lab, flexible learning spaces, outdoor courts, and end-of-trip (EOT) facilities for staff.
- Internal refurbishment works within the administration building on Parkway Avenue to form a new student hub.
- Internal refurbishment of Building K to provide staff facilities
- New student entry from Parkway Avenue
- New sports courts, campus green and associated landscaping

The project will upgrade core facilities to Stream 9 to meet secondary catchment student demand to 2036. It will also upgrade the following core facilities to a Stream 12 (up to 2,040 Students) to support future student growth (either additional primary or secondary student increases):

• Library

• Multi-purpose Facility (Hall)

• Canteen

• Science Laboratories.

The provision of 71 PLS for up to 1,420 students with 37 new PLS, eight (8) SLS with five (5) new SLS and the ability to support a realignment of catchment boundaries to re-direct demand from Merewether Heights PS from Kotara HS to NHS.

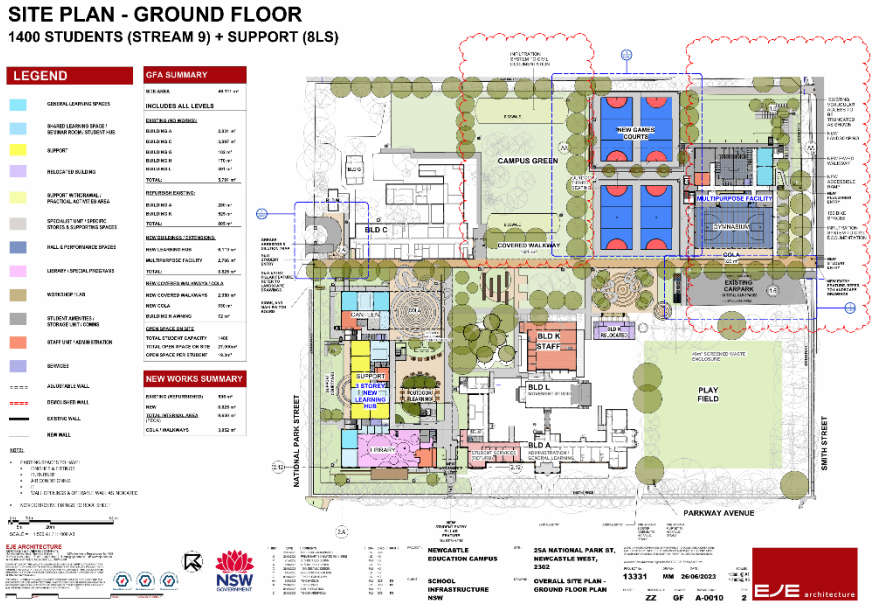


Figure 1 Site Layout Plan

Figure 2 Site Location Plan

4.2.1 Hours of Work

The proposed hours of work for the project are as follows:

- Between 7am and 6pm, Mondays to Fridays inclusive; and
- Between 8am and 1pm, Saturdays.
- No work may be carried out on Sundays or public holidays.

The proposed hours align to Condition C4 of SSD-41814831.

The proposed restricted hours of work for the project, provided that noise levels do not exceed the existing background noise level plus 5dB, which aligns with Condition C5 of SSD-41814831., are as follows:

- Between 6pm and 7pm, Mondays to Fridays inclusive; and
- Between 1pm and 4pm, Saturdays.

The proposed hours of work for the project for specific construction activities such as rock breaking, rock hammering, sheet piling, pile driving and similar activities, which align to Condition C8 of SSD-41814831., are as follows:

- Between 9am to 12pm and 2pm to 5pm, Monday to Friday; and
- Between 9am to 12pm, Saturday

As per Condition C6 of SSD-41814831., Construction activities may be undertaken outside of the hours outlined in Conditions C4 and C5 if required:

a) By the Police or a public authority for the delivery of vehicles, plant or materials; or

b) In an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or

c) Where the works are inaudible at the nearest sensitive receivers; or

d) For the delivery, set-up and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or

e) Where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.

4.2.2 24 Hour Contact Details

The 24-hour contact details for the project is as follows:

Robert Petersen (Project Manager)

M: 0431 500 923

RPetersen@hansenyuncken.com.au

4.3 CEMP Interrelationship with PMP

This CEMP forms part of Hansen Yuncken's Environmental Management and interfaces with the company's Quality & WHS Management Systems. Furthermore, this CEMP is an integral part of Newcastle High School Redevelopment PMP. The following plans referenced within this CEMP form part of the overall PMP for the project and contribute to the environmental management procedures:

- **Project Site Induction** – Ensures all workers onsite are aware of the Environmental Management Plan & also trains all workers onsite on the requirements for controlling: dust & windblown debris, dirt & debris on public roads, protection of stormwater drains, tool & equipment washout, chemical spills, noise disturbance, waste collection & disposal, rubbish & food scraps & excess concrete.
- **Project HSE Risk Assessment** – Identifies what subcontractor onsite are impacted by or the risk of; air quality/dust, archaeology & cultural heritage, chemical spill, flora & fauna, littering, noise disturbance, stormwater contamination & watercourse pollution each month. This will be monitored through task observations scheduled for each month.
- **Noise & Vibration Management Plan** – Identifies mitigation methods to minimise the risk of noise & vibration to the workers onsite and the surrounding properties.
- **Traffic Management Plan** – Summarises how construction and pedestrian traffic will be managed on the project to minimise the impact on the existing facility and the neighbours surrounding to the project.
- **Site Layout Plan** – Identifies the location of sediment controls, access routes, truck washout, location of site bins, spill kits, concrete washout.

- **Emergency Response Plan** – Outlines the process to manage the following environmental emergencies; asbestos exposure, water pollution, fire, major fuel spill & chemical spill
- **Audit Management Plan** – Describes the frequency of internal and external environmental audits and the process for closing out any non-conformances raised.

4.4 Policy & Objectives

The HY Environmental Policy Statement provides the framework for the development of this CEMP (refer appendix A.1), and details the company's commitment to "*providing a high quality environment, which meets the requirements and expectations of; Clients, Statutory Authorities, Employees and Community Groups*", through the application of "*sustainable development principles, to continually improve environmental performance in minimising impact on, and pollution of, the environment during the construction process"*.

The objective of the Construction Environmental Management Plan is to:

- Provide a CEMP in accordance with the relevant guidelines, inclusive of but not limited to the Environmental Management Plan Guideline: Guideline for Infrastructure Projects (DPIE April 2020).
- Satisfy Client requirements related to environmental performance, set out in the Specification for the Works.
- Incorporate and provide mitigation strategies for environmental issues arising from site activities and as detailed in the Newcastle High School Redevelopment SSD-41814831 Environmental impact statement prepared by Gyde
- Encourage best practice environmental management through planning, commitment and continuous improvement;
- Prevent and minimize adverse impacts on the environment;
- Identify the potential for, and respond to, environmental incidents and emergency situations and take corrective actions;
- Identify and control possible environmental hazards with the works and HY activities;
- Identify and protect any special environmental characteristics of the site including cultural heritage significance;
- Define roles and responsibilities and allocate the necessary resources
- Ensure environmental training and awareness programmes are provided to employees and subcontractors;
- Establish mechanisms to monitor, evaluate and report progress.

The HY Environment Policy commits the company to achieve the following goals:

- Develop and promote a culture of environmental leadership, responsibility and continual improvement across the HY business;
- Audit, monitor and ensure compliance with environmental legislative and regulatory obligations and other environmental commitments;
- Utilise the resources of HY to lead the way in defining and achieving best environmental practice; and

- Advance and disseminate environmental knowledge and applied environmental management through training, research and engagement with the wider community

A copy of the Environment Policy is contained within the PMP and displayed at the project / site office and induction sheds. HY recognises this implementation will involve effective training of personnel to ensure they fully understand their responsibilities to comply with and monitor the management system. In addition, all site workers are consulted on HY environmental policies & procedures through the following mechanisms: site induction, notice board, site inspections, prestart meetings, subcontractor meetings, team meetings, toolbox talks.

4.5 Targets

4.5.1 Objective: Reduce waste

KPI: Waste minimisation and recycling

Target: Recycle > 80% of construction waste

Responsibility: HY Site Manager

4.5.2 Objective: Comply with all environmental legislation

KPI: Number of identified breaches of State or Commonwealth Environmental legislation

Target: Nil for duration of project.

Responsibility: HY & Subcontractors

4.5.3 Objective: Minimise impacts on the environment

KPI: Number of significant environmental incidents causing serious harm to the environment

Target: Nil for duration of project.

Responsibility: HY & Subcontractors

4.5.4 Objective: Conduct environmental site inspections to validate environmental conformance

KPI: Schedule and undertake regular site inspections

Target: > 90% of scheduled HSE inspections

Responsibility: HY Site Manager

4.5.5 Objective: Minimise and manage environmental complaints

KPI: Consult with impacted neighbours and promptly address all complaints

Target: ≤ 1 complaint per significant construction milestone

Responsibility: HY Site Manager

4.6 ESD Vision & Principles

The project provides an opportunity for HY to expand its practical and theoretical knowledge of ESD to a level that is considered 'best practice' status.

As such, the ESD vision and principles for HY involves:

- Identification and prioritisation of environmental risk based on AS/NZS ISO 31000:2009 and Guidelines HB158:2010, using qualitative likelihood vs. consequence methods.
- Development of management systems which build knowledge and capacity on environmental issues, principles and sustainable behaviours including training and communication.
- Reduced energy and water consumption as well as waste minimisation during the construction process.
- Environmental training and management of trade contractor's activities to ensure that the project ESD objectives are obtained.
- Efficient and effective use of natural resources in a way that maintains the ecological processes on which life depends
- Sustainable use of renewable energy resources.

4.7 Environmental Planning

In accordance with the contractual requirements, applicable legislation, and in keeping with proper environmental practices, Hansen Yuncken has instituted a methodology which is reflective of observes the requirement, as set out in ISO 14001:2015.

4.7.1 Environmental Aspects & Impact

All activities related to the Newcastle High School Redevelopment, which are enacted by or on behalf of Hansen Yuncken, are identified in the "Project HSE Risk Assessment" (attached in the PMP as Appendix 7). For each activity the environmental aspects and associated actual and potential impacts are identified as they relate to the following environmental elements:

- Location and Land Use;
- Noise & Vibration;
- Traffic and Access;
- Air Quality;
- Soils, Erosion and Water Quality;

- Terrestrial Flora and Fauna;
- Cultural Heritage;
- Site Contamination; and
- Waste Management.

Environmental impacts are detailed in the "**Project HSE Risk Assessment**" and assessed for significance by using the Risk Matrix. Each identified potential impact is rated (Risk rating) in relation to its predicted likelihood and consequence. Environmental Impacts as applicable to the Newcastle High School Redevelopment are summarised in this EMP "Environmental Risk Register" (Section 4.3).

4.7.2 WORK METHOD STATEMENTS

For each activity rated as a significant risk (i.e. Risk class >M/Medium) to the environment, a further Risk assessment is undertaken and any additional controls identified in a Work Method Statement, detailing the; steps involved, hazards, control measures and persons responsible. Furthermore, a Tool Box Talk will be completed, involving all workers responsible for completing the "Significant Risk" activity.

4.7.3 Legal Compliance and Other Requirements

Hansen Yuncken has developed a procedure ("*Legislation Standards and Codes of Practice*"), available on HYWAY to identify legal and other requirements that are applicable to the Newcastle High School Redevelopment and to ensure the accessibility of the information. The procedure shall be referenced and is applicable to those activities and functions that have the potential to interact with the environment.

Furthermore (URL) links are supplied on HYWAY to regulatory body websites and relevant NSW legislation relevant to environmental Aspects and management of the same.

5 Implementation

5.1 Environmental Awareness

All HY and S/C employees shall receive an induction into the project in accordance with the Site Induction procedure including completing the Site Induction Record Form (FM-CORP-HSE-001).

The induction shall include the requirements for the conduct of activities which have the potential for significant environmental impacts on the project which shall be outlined in the project specific Site Induction Handbook.

This document applies to all HY and S/C employees, environmental awareness is the responsibility of every person working on and associated with the project.

5.2 Environmental Impacts of Subcontractor Activities

The environmental impacts of subcontractor activities shall be assessed during the S/C pre-award meeting in accordance with pre-award meeting procedure and the project HSE risk assessment.

5.3 Environmental Risk Register

Environmental Risk Register Summary & Responsibilities		
Environmental Issue	Risk to Project	Responsible Personnel
Location & Land use Residential properties may be impacted with construction works due to construction noise and dust	Medium	PM, SM
Noise & Vibration Construction of the development may result in short term impacts during the project due to the use of heavy machinery and plant as well as construction personnel and vehicle movements.	Medium	PM, SM
Traffic & Access During the 80 weeks of construction there will be impacts on the existing facility and the public roads surrounding the project from construction vehicles and deliveries for site.	Medium	PM, SM

Environmental Risk Register Summary & Responsibilities		
Air Quality During the earthworks, stage of the project there is a risk of poor air quality generated by the constructions works.	Low	PM, SM, S/C
Soils, Erosion, & Water Quality There is a risk of water pollution from the construction works caused by wind or water movement causing sediment and other materials leaving site.	Low	PM, SM, S/C
Terrestrial Flora & Fauna The removal of trees during construction works poses minimal risk to landscaped species throughout the area.	Low	PM, SM
Cultural Heritage It is unlikely that construction works will impact any undisturbed aboriginal artefacts due to the construction zone being in an existing site.	Medium	PM, SM
Site Contamination There is a risk of contamination based on testing conducted prior to construction works commencing (There is a risk of unexpected finds being an existing site).	Medium	PM, SM
Waste Management The risk of the constructions works waste management is low/medium pending the results of existing materials onsite.	Low	PM, SM
Visual There are no risks during construction.	Nil	
Socio-Economic There are no risks during construction.	Nil	

PM - Project Manager, SM - Site Manager, FM - Foreman, S/C – Subcontractor, PCA - Private Certifier

5.4 Location and Land Use

5.4.1 Site Location

The site is identified as 25A National Park Street, Hamilton South; it is located within the Newcastle Local Government Area. Three separate allotments make up the extent of the school site. The real property description is; Lot 1, DP 150725; Lot 1, DP 575171 and Lot 1; DP 794827. The site is zoned R2 low density residential.

5.4.2 Likely Impacts

The construction works will be medium term in nature and will not interfere with the current use of the site as a school. All construction activities will be carried out with due diligence, duty of care and best management practices.

Given the location of residential properties in close proximity to the works area and the live school environment, some impacts associated with construction traffic, noise and dust are likely to affect adjacent residents and the school. These likely impacts will be addressed below.

5.4.3 Mitigation Strategies

- The neighbouring landowners are to be consulted in regards to the construction works, predicted program and any access requirements.
- Land disturbance during construction is to be limited to that required to undertake the construction works
- Construction works to be undertaken in consideration of adjacent vegetation
- Areas disturbed during construction to be returned to the pre-construction condition.

5.5 Noise and Vibration

5.5.1 Likely Impacts

Construction of the proposed development will result in short term noise impacts during the 80-week construction period. The predicted noise levels modelled show that the most stringent noise criterion (night time criterion) will be met with the implementation of the proposed mitigation measures for external mechanical plant and units (Chillers, exhaust fans, etc.).

Noise and vibration is to be limited during school exam days as directed by the Principal.

A minor amount of noise impact associated with traffic is expected to residential houses and the school.

5.5.2 Mitigation Strategies

- Site construction noise will be managed in accordance Noise and Vibration Management Sub-Plan (NVMSP) developed for this project. The NVMSP is based on the proposed construction methodology, activities, durations and equipment type and numbers.
- Keep the community informed in relation to noise intensive activities in the immediate area.
- Provide consultation where prolonged or consecutive periods of construction works are planned.
- Construction activities shall be restricted to the normal EPA specified daytime construction hours (i.e. 7am to 6pm Monday to Friday, 8am to 1pm Saturday, no work on Sunday or public holidays). If

it were deemed necessary to undertake work outside these hours, prior approval would be sought from the Council.

- Any noise complaint received will be investigated as soon as practicable. Any practicable and feasible measures to minimise noise will be identified and implemented if required.
- All possible steps to be taken to silence construction equipment where possible.
- Optimum siting of work areas, vehicle and plant parking areas, materials stockpiles and equipment storage areas in locations where potential acoustical impacts will be minimised.
- All plant and machinery used for the project shall be well maintained.

5.6 Traffic & Access

5.6.1 Likely Impacts

Construction of new site facilities will occur over the duration of the build with some increase in traffic in the local area expected. Construction workers will be instructed not to park in areas immediately adjacent to the Occupied Premises, particularly in areas utilised picking up and dropping off of students, and within the adjacent residential areas.

The construction workforce would vary according to the work being carried out, the construction method and contractor's program. The increased traffic is not predicted to have an impact on local traffic flow and only a minor inconvenience to local road users is expected. Whilst construction works may cause some inconvenience to local residents, any impacts would be minor, localised and short-term.

Construction vehicle routes have been developed with the aim to provide the shortest distances to/ from the Regional and State Road network, whilst minimising the impact of construction traffic on the local streets in the immediate vicinity. Alternative routes would not be used without specific prior approval from the relevant authorities. No trucks will be permitted to layover on approach to the construction sites without formal prior approval. There will be two (2) site compounds to allow completion of works, access to the compounds is anticipated to be by National Park Street and Smith Street via the Pacific Highway, Stewart Avenue.

All construction vehicle movements are to be limited during the school drop-off, 8:30am to 9:30am, and pick-up, 2:30pm to 3:30pm, times.

There is the potential that construction traffic travelling on the access road within the subject site could result in degradation of the road condition. Due to the minor nature of the works the additional traffic load is unlikely to impose any significant additional load upon the existing road network within the site. A Construction Traffic Management Sub-Plan will be developed and form part of the Construction Environmental Management Plan required by the Council's SSD conditions.

5.6.2 Mitigation Strategies

- Prepare a Traffic Management Plan (TMP) based on the detailed construction methodology and use of specific heavy vehicles and construction plant. The Traffic Management Plan is to include measures to minimise traffic impacts ensure public safety and is to be prepared in accordance with:

  - Traffic Control at Work Sites Manual (Transport for NSW 2020)
  - Australian Standard 1742.3 - 2002 Traffic Control Devices for Works on Roads.
- The TMP will be developed in consultation with NSW Roads & Maritime Services (RMS) and Newcastle City Council.
- The TMP will detail hours of operation, heavy vehicle volumes (numbers) and routes, construction staff parking, loading / unloading areas and site access arrangements, all temporary warning, guidance and information signage, and appropriate traffic control devices
- Notify surrounding land owners at least one week in advance of the works
- All vehicles accessing the sites will use the designated access roads
- All roads will be kept clean and free of dust and mud. Where material is tracked onto sealed road, it will be removed so that road pavements are kept safe and trafficable
- All vehicles transporting spoil onsite will be covered and filled to maximum capacity to minimise vehicle movements as required
- All roads, kerbs, gutters and footpaths damaged as a result of construction are to be restored to their pre-construction condition. A dilapidation report will be carried prior to construction
- A dedicated vehicle wash-down area will be established on site
- All traffic shall comply with all applicable traffic laws and regulations including speed limits. All construction vehicles shall comply with the speed limits set for the roads accessing the site

5.7 Air Quality & Dust Control

5.7.1 Likely Impacts

The main impact to air quality during construction is expected to arise from the generation of airborne localised dust associated with demolition and earthworks. Given the close proximity to of neighbouring properties and existing buildings, there is the potential for impact by dust, particularly during windy conditions.

5.7.2 Mitigation Strategies

- Construction vehicles and equipment to be suitably serviced prior to commencement of construction activities and all necessary maintenance to be undertaken during the construction period to meet EPA air quality requirements.
- Excessive use of vehicles and powered construction equipment will be minimised where possible
- All construction machinery will be turned off when not in use to minimise emissions where possible.
- Construction contractors to monitor dust generation progressively.
- Dust suppression methods including the use of water carts will be adopted where required (i.e. on windy days when earthworks and vehicle movements are generating dust).
- Any stockpiled spoil/fill will be protected to minimise dust generation to avoid sediment moving offsite.
- Vehicles transporting spoil from the site to be covered where required.
- The burning of waste materials will not be permitted on site

5.8 Soil, Erosion & Water Quality

5.8.1 Likely Impacts

Earthworks and general ground disturbances associated with the site works may result in sediment and other materials leaving the site via wind or water movement. This may have the potential to result in the water pollution such as turbidity and nutrient inputs, should sediment wash into stormwater or natural drainage lines.

Aspects of the site identified as potentially impacting on water quality includes:

- Excavation for foundations and site levelling;
- Stockpiling and transportation of excess spoil; and
- General construction waste entering drainage lines

5.8.2 Mitigation Strategies

- Construction is to be undertaken in accordance with the Erosion and Sediment Control Plan.
- All erosion and sediment control devices shall be properly maintained for the duration of the work. All structures are to be inspected after rain events and sediment to be removed
- Any temporary stockpiles should be stabilised using sediment fencing or similar.
- All fuels and other hazardous liquids shall be stored at designated construction compounds
- All chemicals used for construction shall be stored and used in accordance with the relevant Safety Data Sheets.
- An emergency spill kit shall be kept at the construction compound.
- Workers are to be made aware of the provisions of Section 120 of the POEO Act with regards to water pollution
- Notification to the EPA in accordance with Part 5.7 of the POEO Act is to be undertaken where a pollution incident occurs
- All construction vehicles and equipment are to be maintained in designated areas away from watercourses
- Construction vehicles shall be appropriately cleaned of any soil or mud prior to leaving each works site at dedicated wash down bays
- “Clean” stormwater shall be diverted around the site where possible
- All existing stormwater pits and drains subject to HY construction works will be silt protected with geo-fabric and/or granular socks. Drains will be monitored and maintained by HY
- Stockpiles to be established at HY approved locations
- Sediment fences shall be installed at required locations at the perimeter of the site
- Stormwater shall be diverted to retention basins
- The location and details of permanent controls shall be included on the Site Layout Plan
- Erosion and sediment controls shall be inspected as part of the Site HSE Inspection

5.9 Terrestrial Flora and Fauna

5.9.1 Likely Impacts

The majority of the redevelopment is to be completed within the existing footprint of the project. In accordance with the Aboricultural Impact Statement prepared by Joseph Pidutti Consulting Aborist, 94 trees will be removed as a part of the construction works. Of the 94 trees that have been identified for removal, 72 trees have been assessed as having a low or very low retention value. A total of 183 trees are proposed to be protected and retained. Pursuant to schedule 5 of the NLEP 2012, Newcastle High School is a listed local heritage item. Based on their age, size and prominence, it is assumed that Trees No. 1 to 15, 117, 118, 160, 161, 164 to 166, and 248 to 251 may have a historical association with the site. All trees that are assumed to maintain historical association with the site are proposed to be retained.

The site contains 12 trees of a species identified in the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) list of Threatened Flora and Fauna, including Tree No. 83, to 86, 88, 89, 91, 92, 94, 95, 108, and 155. Of the 12 trees identified, one (1) is proposed to be removed to facilitate the proposed development, Tree No. 108.

Tree No. 108 is a Magenta Lilly Pilly (Syzygium paniculatum), a species identified EPBC Act list of Threatened Flora and Fauna. The tree's TPZ will likely be impacted during demolition of 'Building P' and construction of a new pedestrian path. The AIA identifies that due to its age and size, the tree has been recently planted, is not considered a remnant species of the area, and its removal would not significantly impact on the vulnerability of the species.

The site is not a biodiversity certified land and is not likely to have any significant impact on biodiversity values. The Biodiversity Development Assessment SSD requirement has been waived by the DPE, see BDAR Waiver.

5.9.2 Mitigation Strategies

- No vegetation removal or modification is to occur beyond the proposed works areas shown on the plans.
- Fireweed should be removed site prior to commencement of earth works
- Carry out landscaping in accordance with the landscape design
- Any areas of significant flora and fauna value which have been identified on the construction site will remain bunted/ flagged during construction.
- If any additional species are encountered the Site Manager shall arrange for works to be ceased in the area and contact the Superintendent for further directions.

5.10 Archaeology & Cultural Heritage

5.10.1 Likely Impacts

The site is an item of local environmental heritage and listed under Schedule 5 of the Newcastle Local Environmental Plan 2012. The southern portion of the site is also located within the Hamilton South Garden Suburb conservation area.

A portion of the site is located within the Hamilton South 'Garden Suburb' Heritage Conservation Area (HCA). The HCA is significant to the local community for the surviving evidence of an early 20th Century subdivision pattern made up of single dwellings on large 'suburban' style allotments generally over 600m2. The area has associational significance with the eminent Australian architect Sir John Sulman.

The SOHI identifies a number of trees as possible heritage trees and other trees have been categorised as being of high retention value if maintained in their existing groups. The 'possible heritage trees' are mature age 'Hills Weeping Figs', 'Norfolk Island Pines', and 'Small-Leaf Figs'. The high retention value trees are typically 'Brush Box', 'London Plane Trees', 'Angophoras' and 'Sydney Blue Gums'.

All works on existing buildings and structures will be managed in accordance with the relevant Cultural Heritage Impact Assessment.

The proposed multi-purpose facility is located within the area archaeological resource NEC AS 1. The ACHA quantifies its impact as follows:

- NEC AS 1 is 4,500m2 in area.
- The multi-purpose facility would adversely affect 1,000m2 and the new sports courts 875m2.
- A total area of 1,225 - 2,625m2 (>40%) would be unaffected and subject to future conservation.

5.10.2 Mitigation Strategies

- All workers (including contractors) should be made aware that it is illegal to harm an Aboriginal object or historic relics, and if a potential Aboriginal object or historic relic is encountered during activities, then all work at the site will cease and the OEH will be contacted to advise on the appropriate course of action to allow the Awabakal People of the Awabakal Nation to record and collect the identified item(s).
- All workers (including contractors) should be inducted concerning Aboriginal cultural heritage values
- In the event that known or suspected Aboriginal skeletal remains are encountered during the activity, the following procedure will be followed:
  a. All work in the immediate vicinity will cease;
  b. The find will be immediately reported to the work supervisor who will immediately advise the environment manager or other nominated senior staff member;
  c. The environment manager or other nominated senior staff member will promptly notify the police and the state coroner (as required for all human remains discoveries);
  d. The environment manager or other nominated senior staff member will contact the OEH for advice on identification of the skeletal material as aboriginal and management of the material; and
  e. If the skeletal material is of aboriginal ancestral remains, the local aboriginal land council will be contacted and consultative arrangements will be made to discuss ongoing care of the remains.
  f. The project team will take all necessary measures to protect the artefacts from being damaged or destroyed.
  g. Works will not re-commence in the area until a written instruction from the superintendent is received.

5.11 Site Contamination

5.11.1 Contaminated Soil Risk Assessment

A risk assessment of contaminated soil shall be conducted at the start of the project in accordance with the following procedure for Contaminated Soil Assessment.

As soon as possible after possession of the site by HY, an assessment of actual or potential soil contamination and its impacts shall be undertaken using the Soil Contamination Assessment on BIM 360 Field.

The purpose of the assessment is to provoke whether HY should have an independent third party to provide recommendations or seek wider advice within the company so that the additional knowledge can reduce the risk profile of contaminated soil.

Projects which have the following criteria should fill in this form:

- Projects with a geotechnical report that nominates fill on bore logs
- Projects which do not have a geotechnical report but have a requirement for material to be exported off the site.

5.11.2 Identification of Contaminated Soil

During construction, it shall be necessary to monitor soil contamination levels (if any), dust levels and water runoff quality, to ensure that health and environmental standards are not compromised. This is especially important as contaminated soil may be excavated and transported around the site.

Upon discovery of contaminated soil, the HY Site Manager shall arrange for works to be ceased immediately in the area and contact the Superintendent for further directions.

Contaminated waste shall be collected, contained, stored, handled and disposed of in accordance with relevant legislation and codes of practice.

5.11.3 Risk of Exposure

It is important to minimise the risk of exposure of construction personnel to soil contaminants by adopting appropriate site controls and industrial hygiene practices. Site controls may include:

- Defining certain areas as contaminated and restricting access to them;
- Appropriate signage;
- Training construction employees in industrial hygiene procedures;
- Keeping non-essential motor vehicles such as personal cars out of contaminated areas;
- Regular medical checks of construction personnel who are exposed to contaminated soils;
- Keeping stockpiles of contaminated material watered down to minimise dust generation in accordance with any water restriction requirements and ensure that runoff is not generated from excessive watering;
- Covering truck loads with tarpaulins and watering material when loading and unloading;
- Wheel washes for trucks and vehicle leaving the contaminated areas;
- Regular road sweeping and cleaning;

- Dust monitoring and adjustment of construction programs to accommodate high risk periods when conditions are windy or very dry; and
- Monitoring of concentrations of volatiles.

Industrial hygiene practices may include:

- Wearing long sleeved shirts and trousers or overalls to minimise dermal exposure;
- Wearing gloves when handling soils;
- Washing hands and faces before eating, drinking or smoking;
- Leaving overalls at site for laundering;
- Showering and washing facilities; and
- Wearing respiratory equipment during times of high dust or volatile emissions.

5.11.4 Release of Contaminants to Soil and Groundwater

Water spraying of stockpiles and of soils being loaded and unloaded from trucks, covering of truck loads with tarpaulins and other measures described in the previous section would minimise the potential for dust to be generated.

If heavily contaminated soil is placed in contact with clean soils, contaminants could be mobilized by rainwater or chemical / physical reactions and affect the clean soils to a limited extent.

Similarly, there is a risk that contaminated soil is not clearly differentiated from clean soil and that mistakes could occur which cause the materials to be mixed or wrongly handled or disposed of.

This shall be overcome by implementing a material tracking system for all contaminated soils and ensuring that construction staff are trained how to use the system.

This shall involve documenting areas containing contaminated soil and putting signage near stockpiles that indicated the type of material present and its contamination status.

It shall also require supervision and documentation of all movements of contaminated materials around the site.

Avoiding contact between stormwater and contaminated soils is difficult to achieve if larger areas of a site are being exposed within a short period, because it does not allow for minimizing the amount of soil that is uncovered or placed in temporary stockpiles.

Therefore, it is necessary to manage stormwater in such a way that it does not mobilize contaminants and transfer them to clean areas.

This may be achieved by:

- Covering stockpiles of contaminated soil;
- Placing stockpiles of contaminated soil on bitumen or other sealed areas;
- Installation of adequate bunding or other approved method to contain runoff;
- Collecting stormwater run-off from stockpile areas; and
- Analytical testing of collected stormwater prior to its release.

Erosion and sediment control procedures in accordance with the relevant Code of Practice may also be applied, but with the additional objective of keeping water that is exposed to contaminated soils separate from water that has only come into contact with clean soils.

Groundwater could potentially be impacted by contaminants mobilized from stockpiled contaminated soil or by buried material.

Minimising runoff from stockpiles, as outlined above would reduce the risk to groundwater.

Land filling of contaminated material which is below the relevant criteria for soil contamination above the water table and capping the landfill area with low permeability material would minimise the risk of groundwater contamination from infiltration of stormwater into buried soils.

5.11.5 Heavy Metal Contamination

Any suspicious industrial wastes encountered will be immediately isolated to enable these assumptions to be confirmed by analytical testing.

5.11.6 Mitigation Strategies

- In the event that unexpected conditions are encountered during development work or between sampling locations which may pose a contamination risk, all works should stop and an environmental consultant shall be engaged to inspect the site and address the issue.
- Excavate a borrow pit to utilise ENM material for required fill to the Learning Hub and Multipurpose Facility. Contaminated soil likely to be unearthed during infiltration system excavation to be placed into borrow pit at time of works
- The Unexpected Finds Protocol outlined in the Remediation Action Plan prepared by Douglas Partners is to be followed.

5.11.7 Unexpected Finds

Unexpected Find shall be addressed in compliance with the Hansen Yuncken's Unexpected Finds protocol listed below:

Unexpected Finds Protocols - General

1. Immediately cease work and contact site foreman
2. Site Foreman to construct temporary barricading to prevent worker access to the unexpected substance(s) and install appropriate stormwater/sediment controls
3. Site foreman to contact Client and arrange inspection by environmental consultant
4. Environmental consultant to undertake detailed inspection and sampling & analysis as per the documented sampling procedures outlined in the RAP analytical results against documented site assessment criteria in the RAP
5. If substance assessed as presenting an unacceptable risk to human health
6. If substance assessed as not presenting an unacceptable risk to human health Site foreman to remove safety barricades and environmental controls and continue work

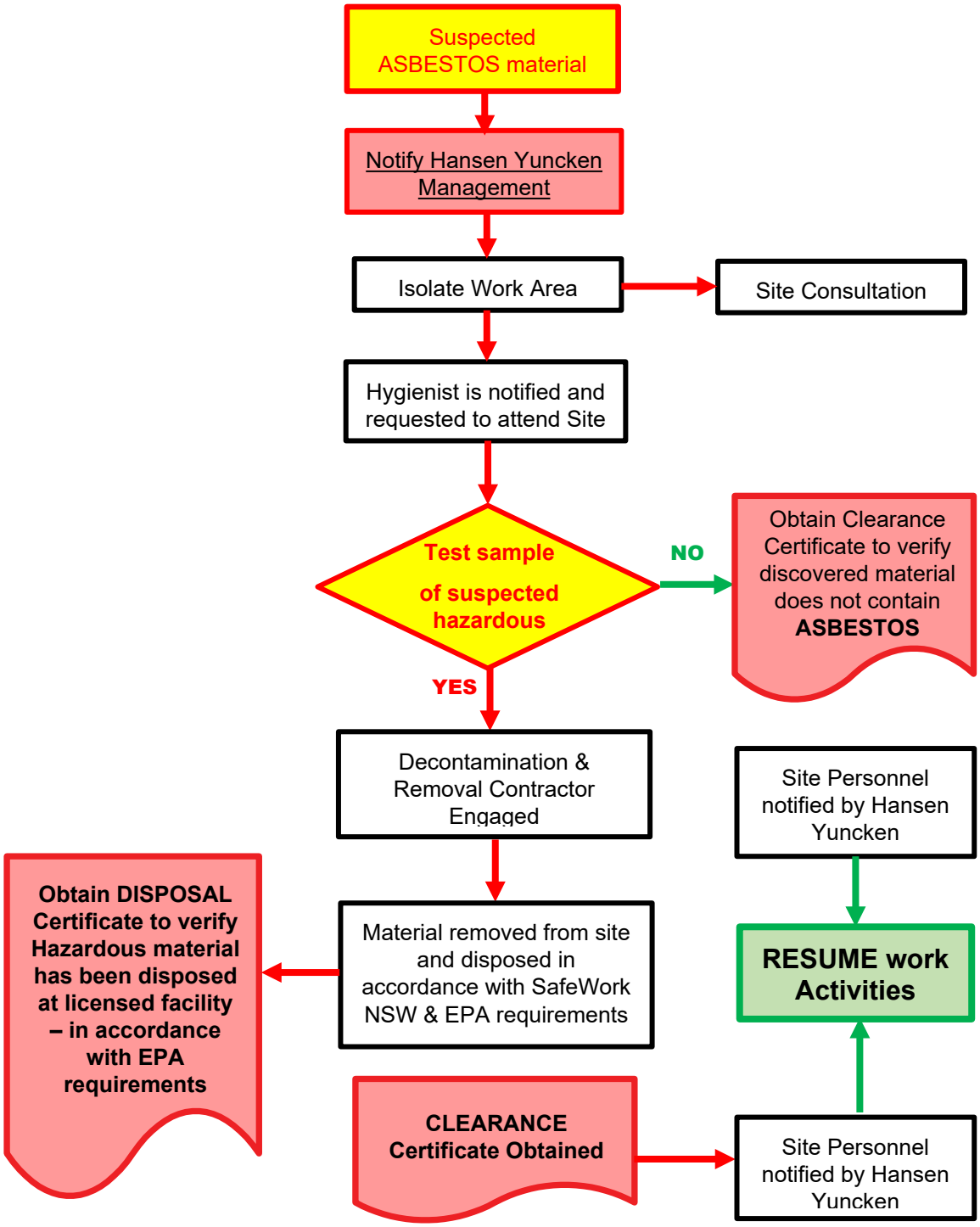
7. Environmental consultant to supervise remediation and undertake validation/clearance as per the remediation/validation/clearance plan
8. Site Foreman to remove barricades and environmental controls and continue work.
9. Environmental consultant to submit assessment/validation/clearance to site foreman for distribution to Client and appropriate regulatory authorities.

Unexpected Finds Protocol - Asbestos

If asbestos is detected in unexpected areas prior to, or during, site development works the following 'Unexpected Finds Protocol' will apply:

1. Upon discovery of suspected asbestos containing material, the site manager is to be notified and the affected area closed off by the use of barrier tape and warning signs. Warning signs shall be specific to Asbestos Hazards and shall comply with the AS1319-1994 – Safety Signs for the Occupational Environment.
2. An Occupational Hygienist is to be notified to inspect the area and confirm the presence of asbestos and to determine the extent of remediation works to be undertaken. A report detailing this information would be compiled by the Occupational Hygienist and provided to the Principal (or their representative) and the site manager.
3. The location of the identified asbestos material would be surveyed using sub-meter Differential Global Positioning System (DGPS).
4. If the impacted soil is to be disposed off site, it should be classified in accordance with the NSW EPA Waste Classification Guidelines (2014) and disposed of, as a minimum, as asbestos contaminated waste to a suitably licensed landfill. In dry and windy conditions the stockpile would be lightly wetted and covered with plastic sheet whilst awaiting disposal.
5. All work associated with asbestos in soil would be undertaken as per the NSW Code of Practice How to Safely Remove Asbestos (2019). SafeWork NSW must be notified in writing at least 5 days in advance of any asbestos works.
6. Monitoring for airborne asbestos fibres is to be carried out during the soil excavation in asbestos contaminated materials.
7. Documentary evidence (weighbridge dockets) of correct disposal is to be provided to the Principal (or their representative).
8. At the completion of the excavation, a clearance inspection is to be carried out and written certification is to be provided by an Occupational Hygienist that the area is safe to be accessed and worked. If required, the filling material remaining in the inspected area can be covered/sealed by an appropriate physical barrier layer of non-asbestos containing material prior to sign–off.
9. Validation samples would be collected from the remedial excavation to confirm the complete removal of the asbestos containing materials. Pending on the type of asbestos identified either the engaged Occupational Hygienist or a Licenced Asbestos Assessor will determine the volume of samples required.
10. The sampling locations should be surveyed using a sub-meter DGPS.
11. Details are to be recorded in the site record system.
12. Following clearance by an Occupational Hygienist, the area may be reopened for further excavation or construction work.

Unexpected Finds Protocol - ASBESTOS



Unexpected Finds Protocol - Buried Structures

In the unlikely event that buried structures such as Underground Storage Tanks (USTs) are encountered during site works, the structure(s) and any associated pipe-work should be managed /removed as follows:

a. Upon discovery of structure, the site foreman is to be notified and the area barricaded;

b. Visual identification of the tank and associated pipe-work;

c. Remove and dispose of the structure and associated pipe-work by a qualified contractor. In the case of an UST, the tank must be removed in accordance with AS 4976-2008 The removal and disposal of underground petroleum storage tanks;

d. Excavate and stockpile impacted materials (based on field observations) for classification;

e. Validation of the remedial pit by a qualified environmental consultant for the contaminants of concern at the following sampling density:

   i) Base of tank pit excavation - 1 sample per 25 m2 (i.e. 5m x 5 m grid);

   ii) Side of tank pit excavation - 1 sample per 10 linear metre (minimum of 1 sample per side) and 1 sample per 2m – 3m depth interval;

   iii) Fuel feed lines/pipe-work - 1 sample per 10 linear metre and 2 - 3 depth interval; and

   iv) QA/QC sampling and analysis in accordance with Section 4.9 of the Project Quality Management Plan.

f. If required, “chase out’ all of materials in the remediation pit identified to be impacted by petroleum/hydrocarbons and further validation sampling and analysis as required to assess appropriate removal of impacted materials;

g. Waste classification and off-site disposal of impacted materials in accordance with the Waste Management Plan; and

h. Inclusion of validation, waste classification and disposal documents (including landfill dockets and, in the case of USTs, tank and pipe work destruction certificates) in the validation report.

Unexpected Finds Protocol - Volatile Contaminants

Based on the findings of the previous assessments, and noting the nature of the filling and soil encountered at the site the potential for the site being impacted by volatile contaminants would be extremely low.

In the highly unlikely event that significant quantities of volatile compounds are detected, then appropriate gas mitigation strategies may be required as per National Environment Protection (Assessment of Site Contamination Measure) Measure 1999 (as amended 2013) ANZECC (1999) Guidelines for the Assessment of On-site Containment of Contaminated Soil.

If impacts due to volatile contaminants are detected in the area to be capped, the nature and extent of the impacts of the volatile contaminants should be established as a first step before an appropriate remedial strategy.

5.12 Waste Management

Refer Waste Management Plan (PMP appendix 18) for further details relating to the management and disposal of waste.

5.12.1 Waste Reduction

The main source of waste associated with the construction works would be demolished material (bricks, concrete, steel etc.) resulting from the demolition and refurbishment of existing buildings. It is likely that some excess building materials will be produced due to the construction work such as miscellaneous waste associated with packaging and transport of plant and equipment and various other manufactured items forming part of the augmentation works. Waste generated as a result of construction will be minimised, recycled, reused or recovered, where practical.

HY has accepted the challenge to reduce waste on construction projects, particularly in materials transferred to landfill.

The strategy for reducing the waste on the project will be made up of three strategies as detailed below in order of priority. The prime objective is to keep the amount of materials transferred to landfill from this project to the minimum possible amount.

1. Reduce the amount of waste material produced on the project by ensuring that only enough materials required to perform the works are ordered.
2. Any excess materials from particular work areas are to be retained and incorporated into other work areas where practical.
3. Encourage “just in time” delivery of construction materials (minimum storage on site) to reduce the potential of loss / waste due to damage prior to usage.

5.12.2 Waste Generation – Fill Material

The project is noted as largely a net cut-fill project with excavation works for the infiltration system noted to be utilised for the fill works for the Learning Hub and the Multipurpose Facility. However, due to the staging of works and soil contamination, the cut material is unable to be used for the fill component of the construction. Three (3) borrow pits will be excavated at the commencement of the project to provide fill for the Learning Hub and Multipurpose Facility. Excavated Natural Material (ENM) will be exported offsite to allow filling of the borrow pit with the contaminated cut material from the infiltration system works. Borrow pits as follows;

Borrow Pit 1

- Clean fill to Learning Hub

- Backfilled with topsoil from Learning Hub and Multipurpose Facility

Borrow Pit 2

- Fill to be crushed and used to fill Learning Hub and Multipurpose Facility

- Backfilled with topsoil from campus green and landscaping works

Borrow Pit 3

- ENM to be exported offsite

- Backfilled with cut from infiltration system works

5.12.3 Non-Recyclable Waste

Non-recyclable waste will be disposed of at an EPA approved landfill or transfer station.

5.12.4 Waste Collection & Disposal

Appropriate waste bins are to be provided by HY and made available to all S/C.

All S/C shall be directed to place waste in the bins provided. This shall be included in the Site Induction.

Waste collection points are nominated on the Site Layout Plan.

5.12.5 Waste Reporting

Waste generation is monitored by HY on monthly basis to ensure that the company's waste reduction objectives are achieved. Waste disposal quantities are monitored monthly by HY to ensure compliance.

The Project Administrator shall record waste disposal data on BIM360 Field using the waste record checklist.

Waste quantities from the PMR shall be entered into the State HSE Database for analysis and reporting against HY Waste reduction targets.

5.12.6 Concrete Waste & Washout

Concrete trucks and pumps shall be washed out at designated locations as shown on the site layout plan. Washout of concrete pumps and AGI's in other areas will not be permitted.

Washout shall be captured using membranes or other suitable means and allowed to set.

Waste shall be placed in bins for disposal with site waste.

Excess concrete shall be returned to the concrete plant for disposal or re-use.

5.12.7 Mitigation Strategies

- Accurate written records are to be kept such as:
  - Who transported the waste (company name, ABN, vehicle registration and driver details, date and time of transport, description of waste)
  - Copies of waste dockets/receipts for the waste facility (date and time of delivery, name and address of the facility, it's ABN, contact person).
- The construction contractor to ensure that waste generated by the works is transported to a place that can lawfully accept it as per Section 143 of the *Protection of the Environment Operations Act* 1997.
- The removal of any asbestos containing material if found is only to undertaken by an appropriately licenced contractor as per WorkCover NSW requirements and current guidelines.
- All waste, including excess spoil be recycled where practicable
- Trucks transporting spoil off site to be covered.
- The EPA is to be notified immediately of any pollution incidents or harm to the environment (as defined under Part 5.7 of the POEO Act).

5.13 Visual

5.13.1 Likely Impacts

The project has minimal visual impact to neighbouring properties and is well screened by existing trees and other building structures.

5.13.2 Mitigation Strategies

- Construct landscaping in accordance with the design documentation to reduce visual impacts of the new development.

5.14 Environmental Complaints

Complaints received regarding HY's Environmental Impacts or performance shall be recorded as Complaint in accordance with the HSE Incident Procedure. Actions to be taken to address the complaint.

5.15 Fuel & Chemical Spills

Response to major fuel spills shall be implemented in accordance with the fuel spill procedure in the Emergency Response Plan. The requirements for storage of large fuel and chemical quantities are not expected for this project.

A spill kit shall be located adjacent to fuel and chemical storage and dispensing areas.

5.16 Hazardous Materials

Hazardous materials shall be controlled in accordance with Hazardous Materials procedure.

5.17 External Lighting

In accordance with condition B11 & B14(a) (iv) of SSD-41814831, the external lighting to the proposed Newcastle High School Redevelopment complies with AS1158.3.1:2005 – Lighting for Roads and Public Spaces and AS4282-2019 – Control of the Obstructive Effects of Outdoor Lighting. A copy of this certificate verifying the compliance with these Australian Standards is provided at Appendix A.13.

5.18 Community Consultation and Complaints Handling

In accordance with condition B14(a) (v) of SSD-41814831, community consultation and complaints handling is primarily the responsibility of the Client. Hansen Yuncken will provide assistance where possible to ensure that the client is complying with the requirements of the Community Communication Strategy developed for the Newcastle High School Redevelopment in accordance with condition B9 of SSD-41814831. Refer Appendix A.17

5.18.1 Community Consultation

Community consultation is primarily the responsibility of the client. Hansen Yuncken will ensure that the relevant strategies/outcomes are incorporated within the relevant management plans and construction process where possible. The client will use a number tools and techniques to keep stakeholders and the local community involved.

5.18.2 Complaints Handling

Hansen Yuncken will provide assistance through the complaints handling process. During the project delivery phase, a complaint is defined as in regard to construction impacts – *such as* – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers or other environmental impacts. If a complaint is made directly to Hansen Yuncken, it will be redirected to the following SINSW communication channels:

- Phone: 1300 482 651
- Email: schoolinfrastructure@det.nsw.edu.au
- Website: schoolinfrastructure.nsw.gov.au

Upon receipt of the complaint, Hansen Yuncken will endeavour to close out the complaint in a timely manner. The complaint will be logged to ensure that the impact of future construction works that may impact the community in a similar manner are minimised.

6 Measurement & Evaluation

6.1 Environmental Incidents & Emergencies

6.1.1 Environmental Incidents

Incidents resulting in potential or actual environmental damage shall be reported and investigated in accordance with the HSE Incident Procedure and recorded on BIM360 using the HSE incident report

6.1.2 Environmental Emergencies

Preparation for and response to the environmental impacts of emergency events shall be conducted in accordance with the project Emergency Response Plan. The environmental impacts controlled in ERP are;

Asbestos Exposure

In the event that during works, personnel become accidentally exposed to asbestos, the following procedures shall be followed:

1. Personnel in the immediate affected area shall cease work and immediately go to the emergency showers on site.
2. All contaminated clothing is to be removed and placed into a thick plastic bag. The plastic bag must then be tightly sealed and labelled as "Asbestos Contaminated Clothing".
3. Personnel are to immediately decontaminate themselves in a shower and a clean set of clothes to be re-issued.
4. Asbestos contaminated clothing is to be industrially cleaned or disposed of appropriately

Water Pollution

An incident involving actual or potential harm to human or environmental health must be reported immediately to the EPA.

Firstly, call 000 if the incident presents an immediate threat to human health or property. Fire and Rescue NSW, the NSW Police and the NSW Ambulance Service are the first responders, as they are responsible for controlling and containing incidents.

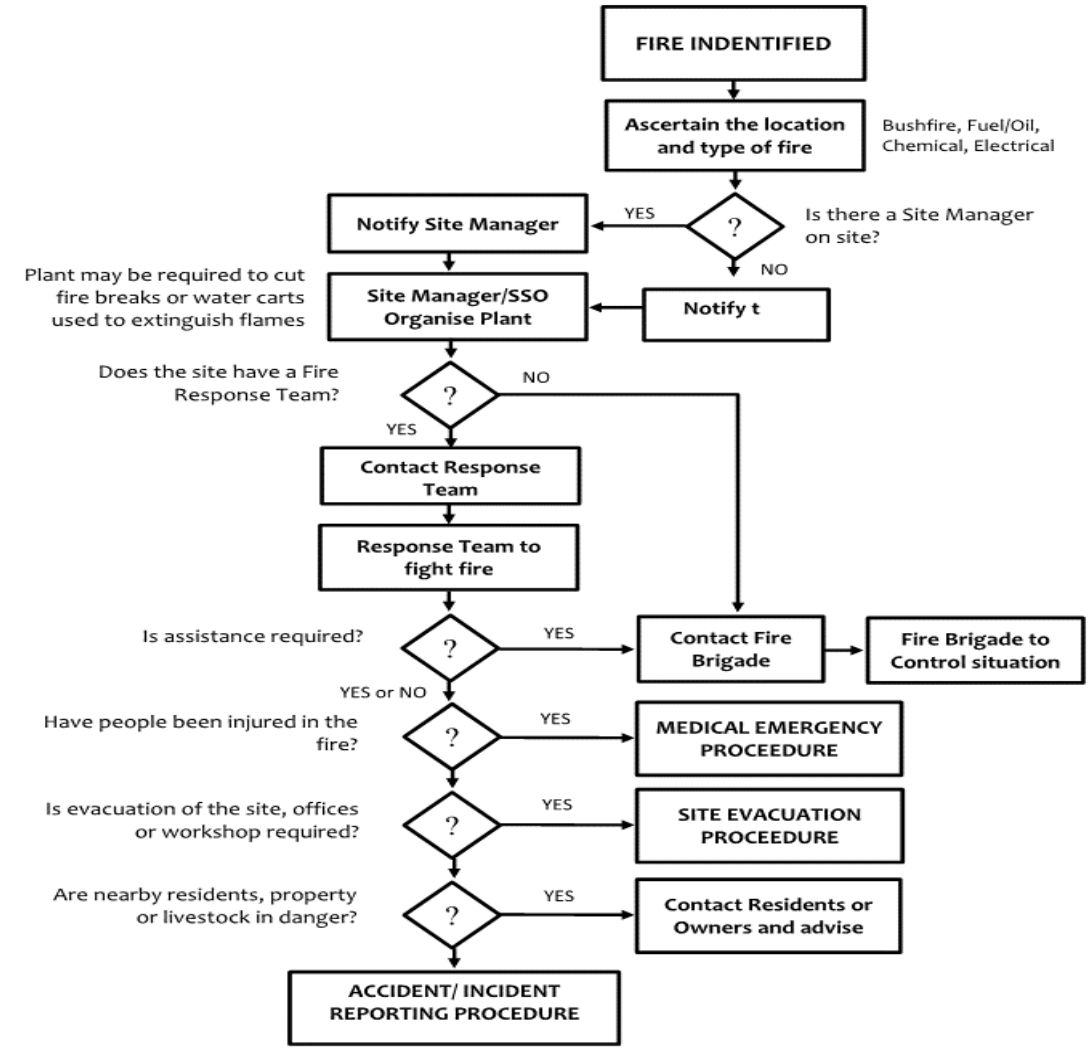
If the incident does not require an initial combat agency, or once the 000 call has been made, notify the HY Site Manager who will notify the relevant authorities in the following order. The 24-hour hotline for each authority is given when available:

EPA Environment Line on 131 555

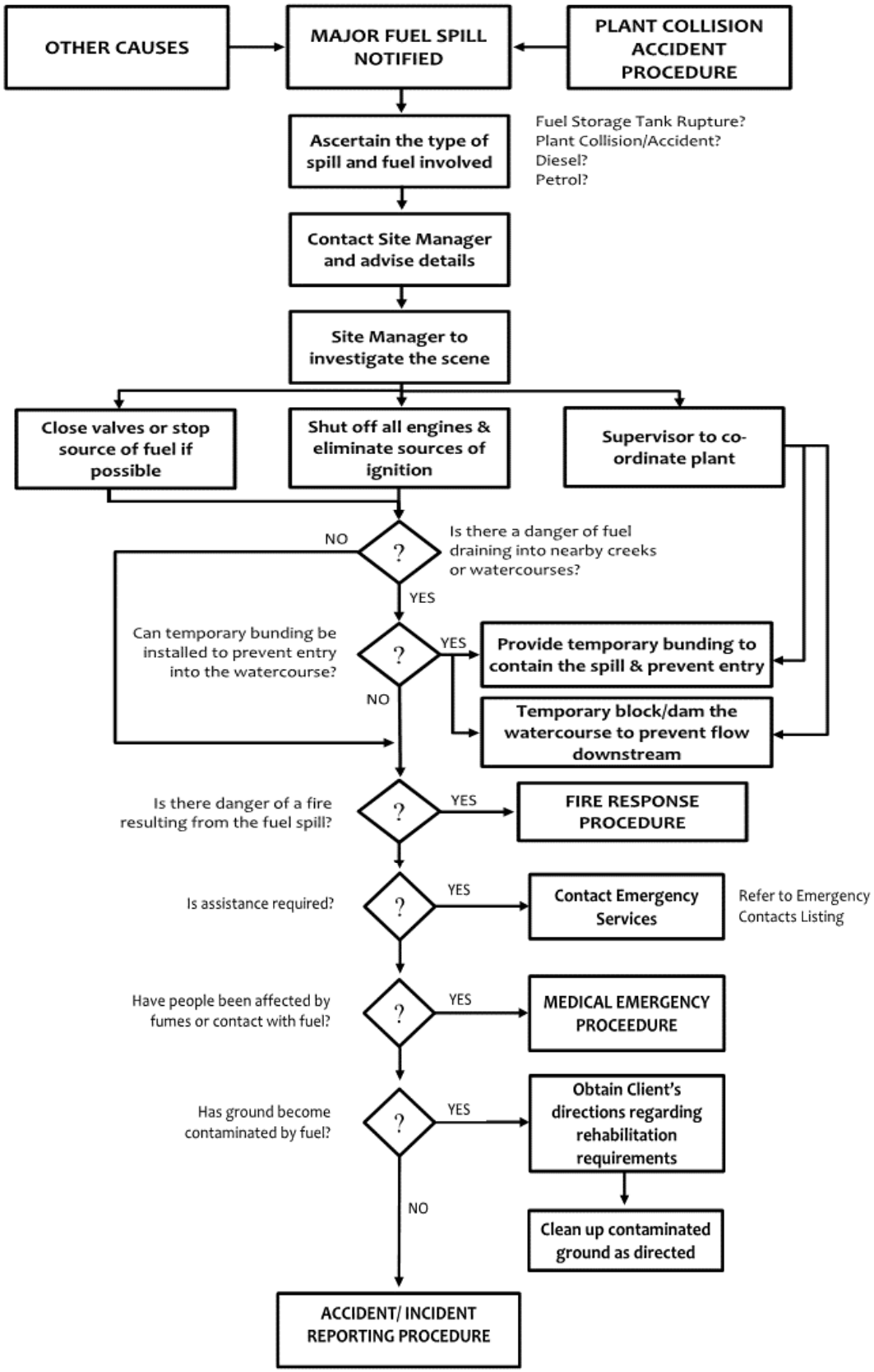
Safework NSW Authority – phone 13 10 50 (Where appropriate)

Relevant Council Telephone (02) 4974 2000

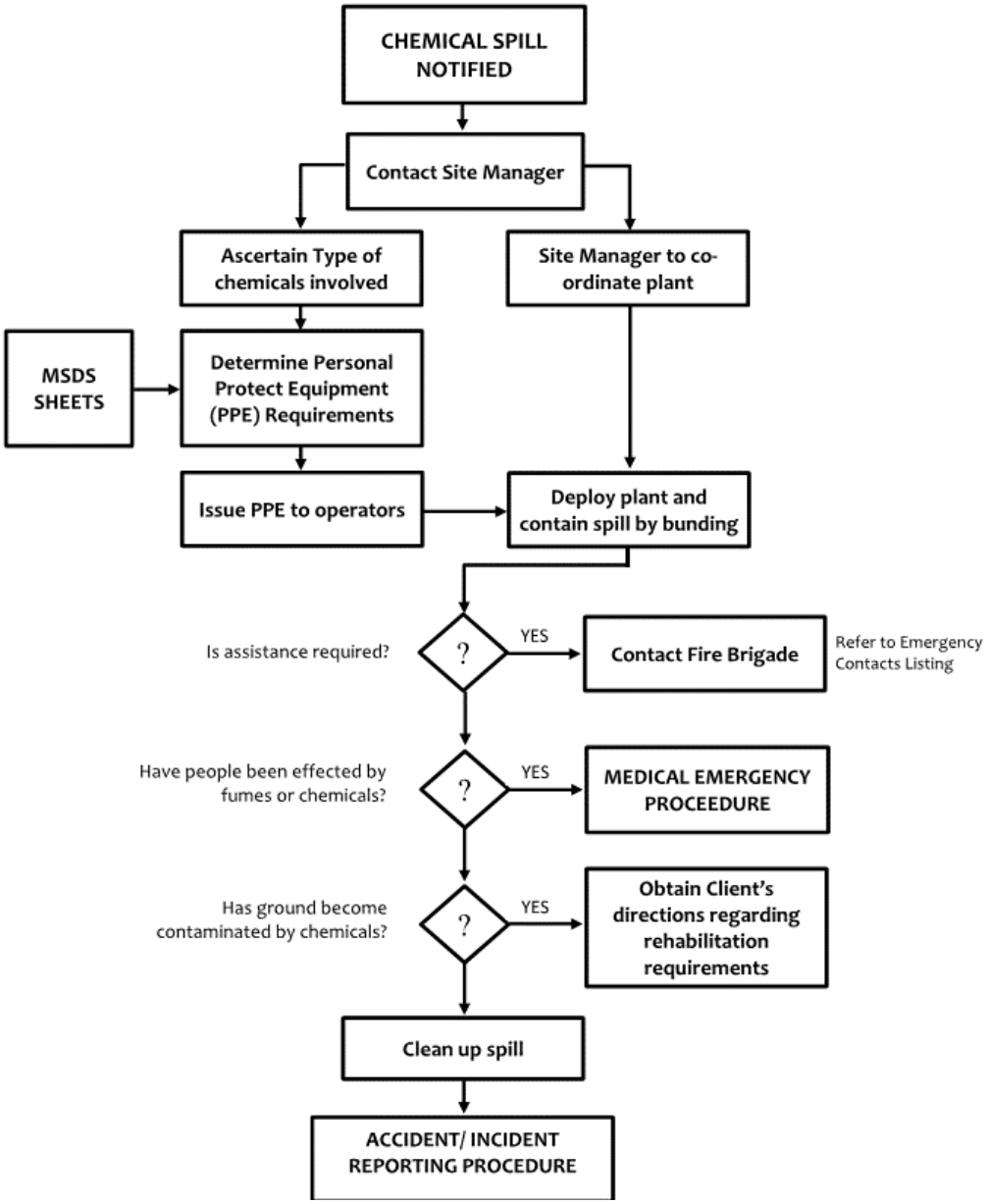
Fire


FIRE INDENTIFIED
Ascertain the location and type of fire
Bushfire, Fuel/Oil, Chemical, Electrical
Notify Site Manager
YES
?
Is there a Site Manager on site?
NO
Plant may be required to cut fire breaks or water carts used to extinguish flames
Site Manager/SSO Organise Plant
Notify t
Does the site have a Fire Response Team?
?
NO
YES
Contact Response Team
Response Team to fight fire
Is assistance required?
?
YES
Contact Fire Brigade
Fire Brigade to Control situation
YES or NO
Have people been injured in the fire?
?
YES
MEDICAL EMERGENCY PROCEEDURE
Is evacuation of the site, offices or workshop required?
?
YES
SITE EVACUATION PROCEEDURE
Are nearby residents, property or livestock in danger?
?
YES
Contact Residents or Owners and advise
ACCIDENT/ INCIDENT REPORTING PROCEDURE

Major Fuel Spill



Chemical Spill



6.2 Environmental Inspections & Audits

Inspections & audits of the site including environmental controls shall be conducted in accordance with the procedure for Site HSE Inspections & the project Audit Management Plan. The following inspections will be conducted onsite throughout the time on the project:

- Fortnightly site inspections,
- Monthly task observations,
- 6 monthly internal audits,
- Monthly external audits in line with the HC21 requirements and,

- Bi-Monthly external audits in line with the HC21 requirements.

Where an item has been assessed as Non-Conformance (NC) during any internal inspection an issue shall be raised in BIM360 Field to bring the activity or process into compliance with requirements. The issue(s) shall be recorded in BIM360 Field and allocated to the relevant contractor/subcontractor.

The independent consultant in writing shall raise all items assessed as non-conformance during external audits and HY will address all issues and close out within the time frame advised.

6.3 National Greenhouse & Energy Reporting (NGER)

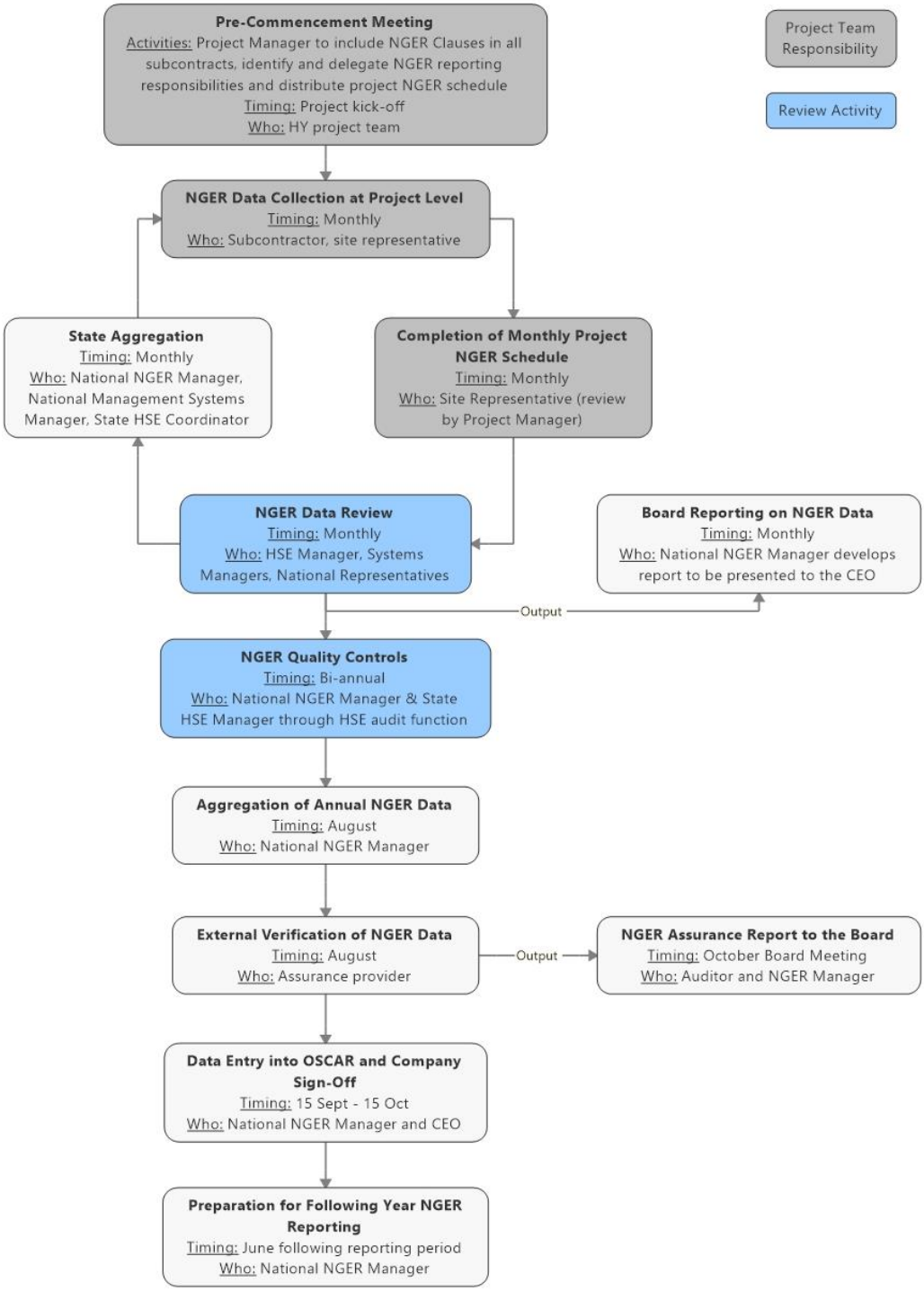
6.3.1 National Reporting Guidelines

The purpose of the National Greenhouse and Energy Reporting Guidelines is to help corporations understand their obligations under the National Greenhouse and Energy Reporting Act 2007 (the Act).

6.3.2 Reporting Thresholds

HY's has been assessed and determined to be below the corporate group reporting thresholds – detailed in the below table. Notwithstanding this, all natural gas and electricity consumption is recorded monthly on BIM360 Field and collated for national reporting. Furthermore, all site mobile plant and equipment fuel consumption is registered on BIM360 Field and incorporated in the HY greenhouse gases (CO2-e) annual report (NGER).

6.3.3 NGER Reporting process



6.3.4 NGER Data Collection

NGER data shall be collected and recorded on BIM360 Field using the Site Electricity and Natural Gas Usage Checklist

7 References

Environmental Planning and Assessment Act 1979 No 203

Environmental Planning and Assessment Regulation 2000

Protection of the Environment Operations Act 1997 (NSW)

Protection of the Environment Operations (General) Regulation 2009

ISO 14001; 2015 Environmental management systems - Requirements with guidance for use

AS/NZS ISO 31000:2009 Risk management – Principles and guidelines

HB158:2010 Delivering assurance based on ISO 31000:2009 – Risk management – Principles and guidelines

NSW Government Environmental management guidelines – Construction procurement (edition 4-December 2019)

8 Appendices

A.1 Hansen Yuncken Environmental Policy Statement

HANSENYUNCKEN

ENVIRONMENT POLICY

At Hansen Yuncken we mitigate our impact as much as reasonably practical to protect the environment during our operation in the building and construction industry, which meets the requirements and expectations of Clients, Statutory Authorities, Employees and Community Groups.

We affirm our legal obligation to comply with relevant environmental legislation, standards and codes of practice as the minimum level of performance and a professional obligation to acknowledge the views of Environmental and Community Groups.

Hansen Yuncken recognises that impacts on the environment in the building and construction industry relate not only to the process of construction but also to the design and subsequent use of the buildings constructed. We affirm our commitment to applying sustainable development principles to all facets of the building and construction process and to continually improve our performance in minimising the impact on, and pollution of, the environment during the construction process.

The Business Performance Committee shall review environmental objectives and set performance targets each year to ensure continual improvement through our 2020/23 Health Safety Environment & Quality (HSEQ) Strategic Plan. State Managers, through their line management structure, are accountable for ensuring all workers achieve these objectives and targets.

The Environment Business Function Workgroup shall monitor compliance with this policy and performance against our objectives and targets and this shall be reported to the CEO and Board of Directors on a regular basis.

In achieving this Hansen Yuncken is committed to the implementation, maintenance and improvement of a Management System complying with:

- ISO 14001:2015 Environment Management Systems

Hansen Yuncken acknowledge that environmental excellence can only be achieved and maintained through clear direction by all levels of management and commitment to continual improvement.

Training, education and awareness are critical to Hansen Yuncken's success in environmental management. Communicating and fostering a collaborative relationship with our workers results in advancement and further pride in our environmental achievements by all workers and stakeholders

Peter Salveson
Chief Executive Officer
January 2022

Page 1 of 1

A.2 Environmental Management Accreditation - ISO14001

CERTIFICATE OF REGISTRATION

Hansen Yuncken Pty Ltd

SCP, Building 1, Level 3, 75-85 O'Riordan Street, Alexandria NSW 2015 Australia
Suite 12/125 Bull Street, Newcastle West NSW 2302 Australia
and transient sites

complies with the requirements of

ISO 9001:2015
Quality Management Systems – Requirements

and

ISO 14001:2015
Environmental Management Systems – Requirements with guidance for use

for the following capability:

This registration covers the Quality and Environmental Management Systems for the provision of project management and the design and construction of commercial, industrial and institutional buildings and civil engineering works.

Registered by:
Quality Control Services (Environmental) Pty Ltd
ABN 16 994 323 622
10 Rosina Street Woodcroft South Australia 5162 Australia

This certificate is subject to the Terms and Conditions for Certification, and relevant program rules. Currency of certification can be validated at www.qcse.com.au and www.jas-anz.org/our-directory/certified-organisations; it remains the property of QCSE Pty Ltd and must be returned upon request.

Certificate Number: 160052025
Issue Date: 11 February 2022

Original Certification: 23 February 2010
Expiry Date: 22 February 2025

cAStone

Cheryl Stone
Certification Manager

QCSE

QMS/EMS Certified Company
Licence Number: Q0160

IAF

Quality Control Services QCS ENVIRONMENTAL

JAS-ANZ

www.jas-anz.org/register

A.3 Site Location

Figure 3 Site Location - 160/200 Parkway Avenue, Hamilton South

A.4 HSE Project Risk Assessment

HANSENYUNCKEN

PROJECT HSE RISK ASSESSMENT

This Project HSE Risk Assessment is to be used as a guide when completing the monthly Project High Risk Identification assessment on HYWAY Site Management Dashboard in accordance with the Project HSE Risk Assessment procedure and should be conducted at the time of Construction programme statusing to assess hazards and risks for next month. Hazards with residual risk from the Design WHS Risk Assessment (if applicable) are also to be considered.

			Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
RELEVANT PROCEDURE:	Project HSE Risk Assessment			1	2	3	4	5
PROJECT:	**Newcastle High School Redevelopment**		5	Medium	High	High	High	High
JOB NO:	**SN111**		4	Medium	Medium	High	High	High
ASSESSED BY:	Robert Petersen		3	Low	Medium	Medium	High	High
			2	Low	Medium	Medium	Medium	High
ASSESSMENT DATE:	24-Jan-24		1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Amenities								
Access	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Wide concrete footpaths have been installed for safe access to all amenities in the compound area. The compound area is fenced off to protect workers from moving plant, trucks and vehicles	1	2	Low
Location and nature of workplace	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	All amenities are set up in a compound area at the main entry to site making it easy for access and egress in emergency situations	1	2	Low
Housekeeping	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	A cleaner is engaged to manage and maintain all amenities.	1	2	Low
Seating	2	2	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Sufficient seating is in place for all workers to rest, take breaks and eat lunch	1	1	Low
Lighting (Poor)	2	4	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Lighting is setup in all amentities for safe access	1	3	Low
Air Quality	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Windows, fans and airconditioning are installed to all site sheds	1	2	Low
Hot and Cold Environment	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Air conditioning installed to all lunch sheds	1	2	Low
Drinking water	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Bubbler set up at lunch sheds and varoius locations	1	2	Low
Dining Facilities	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Clean and tidy tables are available in all lunch sheds. There is sufficient space for all workers to site down and have lunch	1	2	Low
Hand washing	2	4	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Warm water, soap and paper towels are available in the toilets	1	3	Low
Shower Facilities	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Hot showers are provided on site	1	2	Low
Change Room	2	3	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Change rooms with benching and coat hooks are proivded on site for workers to change clothes	1	2	Low
Air Quality								
Dust from plant & truck movements	3	3	Medium	WHS Plan	Water cart to conduct regular laps of the site spraying water on the ground to keep dust settled particularly where there is high plant and truck movements. Temporary water has been installed at several locations around site.	2	2	Medium
Refuelling of plant and equipment	4	2	Medium	AS/NZS 1715 Selection, use and maintenance of respiratory protective devices AS/NZS 1716 Respiratory protection devices	All refuelling is to be conducted in well ventilated areas only. Refuelling to be conducted clear of any hot works on site such as grinding, welding etc	3	1	Low

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PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment	**Likelihood**	**Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant**					
PROJECT:	**Newcastle High School Redevelopment**		1	2	3	4	5	
JOB NO:	**SN111**	5	Medium	High	High	High	High	Likelihood 1- Very unlikely 2- Remotely possible 3 - Possible 4 - Likely - 5 - Very Likely
		4	Medium	Medium	High	High	High	
ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	
		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Concrete cutting / coring (Silica Dust)	3	3	Medium	NSW Cutting & Drilling Concrete & Other Masonry Products 1996	Water must be used to minimise dust. Demolition saws take preference over dry cutting with a masonry blade on an angle grinder. Rubble to cleaned up immediately. Slurry to be cleaned up immediately. Vacuum attachments to be used where possible, Dust P2 masks to be worn at all times, masks to be fit tested and worker to be clean shaven. All controls must be in accordance with HYer Quick Guides - Silica Management.	2	2	Medium
Access/ Egress and movements around site								
Workers entering site without Hansen Yuncken permission would be unaware of any specific site hazards eg, asbestos, gas lines, high risk construction work etc	4	2	Medium	NSW Code Of Practice: Consultation, coordination and cooperation	All workers must be site inducted by Hansen Yuncken prior to entering site. This is clearly marked on the contact details sign at the main entry to site. Subcontractors must give Hansen Yuncken site staff sufficient notice prior to workers attending site to be site inducted. All workers are required to sign in and out electronically each day, regular checks will be undertaken to ensure compliance. Site induction through Hammertech.	3	1	Low
Visitors entering site without Hansen Yuncken permission would be unaware of site hazards eg, asbestos, gas lines etc	4	2	Medium	NSW Code Of Practice: Consultation, coordination and cooperation	All visitors must sign in at the site office prior to entering site. Signs have been erected clearly stating this. Visitors must be escorted by a fully inducted guide at all times. Visitors entering site must have approval from the Hansen Yuncken Site Manager.	3	1	Low
Pedestrians/ workers walking around site being struck by vehicles/trucks/ plant moving around site	4	2	Medium	NSW Code of Practice: Moving Plant On Construction Sites	Bunted/fenced off pedestrian pathways have been erected on site to keep pedestrians clear of areas where there are high movements of vehicles/ trucks and plant. All subcontractors using moving plant must have a HRCW SWMS which details how to protect other workers in the area from being struck by the plant. All plant must have a flashing light, horn and reversing beeper. Vehicles/ trucks must turn their flashing lights on. There is a 10km/h speed limit on site. All workers have been told at the site induction to be aware of moving plant on site and keep clear whenever possible. Only workers who are involved with the task are to be in the vicinity of the plant. HY have instructed all subcontractors to train their workers through pre-start meetings on how to approach moving plant and equipment. Haul roads for plant and vehicles are to be maintained. Pedestrians are to avoid walking on haul road whenever possible. Plant operators are to keep reversing to a minimum. Pedestrians that need to approach moving plant are to do so from the front of the machine and are to gain the operators attention by waving arms and yelling out to the operator. No person is to approach the machine until the operator has stopped moving the machine and signalled that it is safe to approach. Spotters working with machines must always stand in an area where they are visible to the operator. A site spotter will be used on site as required, this will be monitored by the site team. Plant movement and spotter requirements will be discussed at the site pre start meeting..	3	1	Low
Public being struck by trucks entering and exiting site	4	2	Medium	NSW Code Of Practice: How to manage work health and safety risks	Access to the site is safe and clear of any obstructions, visibility for the driver and any pedestrians is excellent. Should the need arise traffic controller will be organised to control movement into and out of site, Site Manager will manage this process.	3	1	Low
Subcontractors bringing vehicles onto site without Hansen Yuncken permission	3	3	Medium	- Traffic Management Plan	All subcontractors must seek approval from the Hansen Yuncken Site Manager prior to bringing vehicles/ trucks onto site.	3	1	Low

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PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment
PROJECT:	**Newcastle High School Redevelopment**
JOB NO:	**SN111**
ASSESSED BY:	Robert Petersen
ASSESSMENT DATE:	14-Mar-24

Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
	1	2	3	4	5
5	Medium	High	High	High	High
4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Workers slipping/ tripping over on muddy/ uneven ground	4	2	Medium	- WHS Management Pan	Pedestrian pathway has been constructed to minimise slip and trip hazards. Wheel ruts, eroded ground, muddy haul roads and pathways are to be bladed back to solid ground as required. On rain days the foreman & safety committee (when established) is to walk the site prior to work commencing and determine which areas are safe for work and which areas are no go zones.	2	1	Low
Vehicles becoming bogged or losing traction whilst entering/ exiting and driving around site	1	3	Low		Vehicles to be driven on solid ground only. No vehicles will be allowed to drive on muddy terrain	1	2	Low
Collisions between plant on site	1	3	Low		Sufficient distance to be kept between all plant on site. Flashing light, horn and reversing beeper must be working. Plant and vehicles to stay on haul roads whenever possible. Site speed limit is 10km/h	2	1	Low
Too many vehicles parked on site creating restricted access around site	1	2	Low		No Parking onsite	1	2	Low

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PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment
PROJECT:	**Newcastle High School Redevelopment**
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ASSESSED BY:	Robert Petersen
ASSESSMENT DATE:	14-Mar-24

Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
	1	2	3	4	5
5	Medium	High	High	High	High
4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

HAZARD (Include additional project specific hazards as required)	RISK ASSESSMENT L	C	Class	CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks) Legislation, Standards & Codes of Practice	Enter Details of Specific Controls Required	RESIDUAL RISK ASSESSMENT L	C	Class
Asbestos								
Workers being exposed to the asbestos contaminated soil at various locations around site -	3	3	Medium	Working with asbestos guide 2008	An unexpected asbestos find protocol has been developed.	3	2	Medium
Unidentified finds of asbestos	3	3	Medium	Environmental Management Plan Code of Practice -How to manage and control asbestos in the workplace Code of Practice - How to safely remove asbestos	An unexpected asbestos find protocol has been developed. Work must be immediately stopped in the area and notify HY site team who will arrange for the asbestos to be removed in line with asbestos procedure. Warning signs and tape to be used to prevent unauthorised persons entering the area. Advice from hygienist will be followed e.g. air monitoring, and all workers doing remediation work must weat PPE as per SWMS.	3	2	Medium
People being exposed to airborne asbestos particles during asbestos removal	3	3	Medium	Code of Practice - How to safely remove asbestos	SC High Risk Construction Work Safe Work Method Statements Maintain an asbestos register in BIM 360 Analysis by NATA registered organization to determine if material is ACM (friable or bonded) Occupational Hygienist to be consulted to determine types of asbestos precent and to develop a scope of works on methods of removal. Asbestos Management Plan to be developed and a copy must be: •given to the person who commissioned the licensed asbestos removal work •readily accessible on-site for the duration of the licensed asbestos removal work to: o a person conducting a business or undertaking at the workplace oworkers and their health and safety representatives othe occupants of the premises (if domestic premises). Notify SafeWork NSW five calendar days before undertaking any licenced asbestos removal work. Isolate affected areas where ACM is identified as being present Signage to be installed where ACM is identified as being present Only suitably qualified and competent contractors perform asbestos removal in line with legislative requirements Use respiratory PPE for hazardous tasks as outlined in the Code of Practice All asbestos waste, friable asbestos and small pieces of non-friable asbestos must be contained in new heavy-duty 200 µm polythene bags to prevent exposure to airborne asbestos fibres. Asbestos sheeting and redundant asbestos-lagged pipes and equipment should be contained in heavy-duty 200 µm (minimum thickness) polythene sheeting and contained in suitable bins. Air monitoring is performed as determined by the Occupational Hygienist Air monitoring results to be posted on site noticeboard. Communicate asbestos areas to workers Clearance certificates to be obtained prior to workers, apart from asbestos removalists, entering the area Compliance with HY Procedure - Asbestos	2	2	Medium

HANSENYUNCKEN

PROJECT HSE RISK ASSESSMENT

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JOB NO:	**SN111**
ASSESSED BY:	Robert Petersen
ASSESSMENT DATE:	14-Mar-24

Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
	1	2	3	4	5
5	Medium	High	High	High	High
4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Asbestos containing materials being disposed of at unauthorised sites.	2	3	Medium	Code of Practice - How to safely remove asbestos	ACM to be disposed at approved waste management facilities Tracking dockets for disposal of asbestos waste to be provided by the SC	1	3	Low
Atmosphere - Contaminated/ Flammable								
Flammable fumes from fuel containers	4	2	Medium	NSW Code of Practice: Storage and Handling of Dangerous Goods	Fuel to be stored in fuel storage areas only. Fuel drums are to be placed back in the fuel storage area after refuelling has been completed. No refuelling near any hot works being undertaken. All subcontractors must have a 'refuelling SWMS'	3	1	Low
Unsafe storage of fuel	3	2	Medium	AS/NZS 2430 Classification of hazardous areas	Fuel must be stored in ventilated cages. No fuel to be stored in shipping containers	2	1	Low
Fumes from spray selear application to slab	3	2	Medium	AS1318 Use of colour for the marking of physical hazards and the identification of certain equipment in industry	Applicators must wear mask whilst spray painting. Warning signage to be erected and all other personnel not involved with the task are to be clear of the area	2	1	Low
Biological Hazards								
Disease from unhygienic facilities and amenities	1	3	Low	NSW Code Of Practice: HIV and other blood-born pathogens in the workplace - WHS Management Plan NSW: Code Of Practice: Work Place Amenities	A cleaner has been engaged by Hansen Yuncken to clean amenities on a weekly basis. Amenities to be kept clean and tidy at all times	1	2	Low
Bomb Threat								
Persons unaware of what to do in the event of an emergency	1	3	Low	HY Emergency Response Plan AS 2293 Emergency escape lighting and exit signs for buildings AS 3745: 2002 Emergency Control Organisation and Procedures For Buildings, Structures and Workplaces	Emergency response procedure is explained to all workers at the site induction. HY to practice emergency drills every 6 months to ensure the system is working.	1	2	Low
Changes in design								
Changes in design could result in new hazards not being identified	1	3	Low	- WHS Management Plan	All design changes must be risk assessed by HY. Subcontractor SWMS will be reviewed by HY as required	1	2	Low
Craning & Hoisting Operations								
Persons/ other trades on site walking into the crane slew area may be struck by crane or load	4	3	High	AS 2550: Cranes, hoists & winches - Safe Use - WHS Plan	The work area around all cranes must be fully barricaded eg bunting and signposted to keep other workers clear and exclusion zone setup	2	2	Medium
Slings or chains failing resulting in loss of load	5	2	High	AS 1418.1: Cranes, hoists and winches – General Requirements AS 4991 Lifting Devices - WHS Plan	Subcontractors must keep an up to date register of all chains and slings. All equipment must be visually checked daily prior to use.	3	3	Medium
Crane out riggers sinking in ground resulting in crane rolling over	5	2	High	NWHSC 1010: National Standard for Plant - WHS Plan	Subcontractor SWMS to detail craning and hoisting operations. Subcontractor to communicate with HY staff and obtain a plant setup permit prior to setting up cranes to ensure outriggers are not set up over underground services or in unstable ground conditions. Geotech report for every set up.	3	3	Medium

HANSENYUNCKEN

PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment			**Likelihood**	**Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant**			
PROJECT:	**Newcastle High School Redevelopment**				1	2	3	4	5
JOB NO:	**SN111**			5	Medium	High	High	High	High
				4	Medium	Medium	High	High	High
ASSESSED BY:	Robert Petersen			3	Low	Medium	Medium	High	High
				2	Low	Medium	Medium	Medium	High
ASSESSMENT DATE:	14-Mar-24			1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			**CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)**		**RESIDUAL RISK ASSESSMENT**		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Crane striking structures whilst slewing	5	2	High	AS 1418.10(Int): Cranes, hoists and winches - Elevating work platforms - WHS Plan	Dogman and crane operator to constantly communicate with each other. Crane operator to take directions from dogman only.	3	2	Medium

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PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment	**Likelihood**	**Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant**					
PROJECT:	**Newcastle High School Redevelopment**		1	2	3	4	5	Likelihood 1- Very unlikely 2- Remotely possible 3 - Possible 4 - Likely - 5 - Very Likely
JOB NO:	**SN111**	5	Medium	High	High	High	High	
		4	Medium	Medium	High	High	High	
ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	
		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Concrete								
Concrete Pumping - overload formwork structure	5	2	High	NSW Code Of Practice: Pumping Concrete 1993	Spotter to be used when positioning boom over formwork	3	2	Medium
Trip hazard after excess concrete has cured	4	2	Medium	Environmental Protection Act 1994	Back to plant policy for large amounts of excess concrete	3	1	Low
Slip hazard from excess water and slurry on the ground/ concrete washout	4	2	Medium	- WHS Plan	Concrete washout to be set up in area where water will not run over pedestrian pathways. Generally plastic is rolled out on the ground. The hopper is washed out onto the plastic, the concrete cures then is placed in a skip bin the following day	3	1	Low
Slurry and wet concrete entering stormwater drains	3	2	Medium	- WHS Plan	The concrete washout area will constantly move on site to suite site conditions. The HY site foreman will determine where the wash out area will be on the day of any concrete pours.	2	1	Low
No designated washout area could result in truck drivers washing out wherever they please leaving the site messy and untidy	3	1	Low	- WHS Plan	Excess concrete from washing out the pump is to be placed onto plastic, allowed to set then placed into the skip bin with a telehandler	2	1	Low
Concrete cutting / coring - Silica dust	4	2	Medium	- WHS Plan	Water must be used to minimise dust. Demolition saws, wet saw and vacuum extraction systems to be used, dry cutting is not acceptable. Rubble to cleaned up immediately. Slurry to be cleaned up immediately and disposed off in sealed bags. All controls must be in accordance with HY quick guide - silica management. cutting and core permit to be in- place	2	1	Low
Strike PT cables whilst cutting concrete	4	2	Medium		Review As Constructed Drawings, consult structural engineer and obtain permission to proceed. Enact cutting/coring permit prior to any works commencing.	2	2	Medium
Confined Space								
Poor ventilation inside in-ground pits	3	2	Medium	NWHSC 1009: Safe Working in a Confined Space AS 2865: Confined Spaces NSW Code of Practice: Confined spaces	No chemicals are to be used inside in-ground pits. Close supervision of all men working inside pits at all times. Lid to be kept open at all times. Sparging up of pits is to be conducted as pit risers are installed to minimise the need to enter the pit afterwards	2	1	Low
Workers unable to easily enter and exit trenches	2	2	Medium	- WHS Plan	All trenches over 1.5m must be benched at 1:1 at a maximum of 1.5m or battered at 45 degrees. A ramp or steps must be cut into the trench for easy pedestrian access.	2	1	Low
Workers unware of conditions of the confined space	3	4	High	WHS Plan	Confined space risk assessment to be undertaken prior to works to determine the conditions of the space. Confined space work permit to be issued and inplace for the duration of the works.	2	1	Low
Workers being overcome by fumes building up in open trenches	2	2	Medium	NSW WHS Regulation 2011: Part 4.3 Confined spaces	All open trenching has good ventilation. Refuelling does not occur inside open trenches. Oxy acetylene equipment is kept clear of open trenching. All pits and trenching to be risk assessed.	2	1	Low
Deliveries To Site								

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ASSESSED BY:	Robert Petersen
ASSESSMENT DATE:	14-Mar-24

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3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
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Likelihood
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HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Delivery vehicle drivers unaware of site hazards	4	2	Medium	NSW Code of Practice: Moving Plant On Construction Sites: 2004	All delivery drivers must complete a 'delivery driver induction' prior to entering site. A delivery driver induction is an abridged induction similar to a visitors induction. Delivery drivers are to be escorted at all times by the relevant subcontractor supervisor. DRIVERS ARE PROHIBITED TO DRIVE ANYWHERE ON SITE WITHOUT AN ESCORT Flashing lights or hazard lights are to be turned on whilst manoeuvring around site. All drivers MUST wear the following protective clothing: •Safety Footwear; •Hi-visibility clothing •Hard Hat; •Gloves (if manual handling is being undertaken). Delivery drivers must remain in the designated “Driver Safe Zone” After loading/unloading, all drivers must be escorted from the site by the relevant subcontractor supervisor. Failure to follow any of the site rules and requirements of this delivery process will result in the driver being removed from site immediately and will prohibit the driver from accessing site until they have been re-inducted into the process.	3	1	Low
Delivery vehicle unloading in an unsafe area eg. in an area where there is mobile plant or pedestrians frequently moving past	4	2	Medium	- Site WHS Plan	The subcontractor supervisor must have good communication with the delivery driver and escort him to the work area where the delivery is to be unloaded. The s/c supervisor must take charge and assist the driver to unload materials from the truck. Exclusion zones to keep people clear of loading/unloading areas will consist of Blue flagging and loadign/unloading signs. Delivery Driver Safe Zone will be established.	3	1	FALSE
Pedestrians/ other workers in the area being struck by materials as they are being unloaded from the truck	4	2	Medium	- Traffic Management Plan	All delivery drivers are instructed at the 'delivery driver induction' to be aware of any pedestrians/ other workers in the area. Delivery drivers must ensure they have enough space to unload/ load materials from trucks safely. If they have any problems they must notify HY staff immediately whom will assist the driver to undertake their task safely. Subcontractors must manage and supervise their deliveries on site. Subcontractors must spot the driver whilst materials are being unloaded and warn other workers in the area to keep well clear.	3	1	Low
Untrained delivery drivers using plant to unload goods	2	2	Medium	- Site WHS Plan	HRSWMS must be in place for subcontractors using plant to unload their delivery	2	1	Low
Drugs & Alcohol								
Persons under the influence of drugs or alcohol are at high risk of injuring themselves or others	2	2	Medium	Alcohol and other drugs in the workplace guide - 2006	Persons assumed to be under the influence of drugs or alcohol will be stopped from working immediately. Their employer will be notified who will investigate and take appropriate action as per their drug and alcohol policy.	2	1	Low

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	RISK ASSESSMENT			**CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)**		**RESIDUAL RISK ASSESSMENT**		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Dust								
Disruption/ nuisance to neighbours and client	3	2	Medium	NSW Code of Practice: Control Of Workplace Hazardous Substances	Shade cloth installation to site perimeter fence to contain all dust within the construction site.	2	1	Low
Eye injuries and respirable damage to workers	3	2	Medium	AS/NZS 1336 Recommended practices for occupational eye protection	Water carts and hoses used to keep dust to a minimum. Plant and trucks to move at low speeds to keep dust settled. Eye protection to be worn for any task that creates large amounts of dust	2	1	Low
Dust from wall chasing	3	2	Medium	AS/NZS 1715 Selection, use and maintenance of respiratory protective devices	Dust must be minimised whilst wall chasing by way of vum system. Workers must wear dust mask whilst wall chasing. Rooms are to be swept frequently to minimise dust	2	1	Low
Dust from concrete cutting/coring (Silica)	3	4	High		Monitoring to be undertaken to determine base levels of silica dust in the working environment atmosphere. Recommendations from hygienist monitoring report to be incorporated into HRCW SWMSs Dry cutting or grinding of silica containing products is not permitted under any circumstances. Water/dust extraction system must be used to minimise dust. Vacuum attachments to be used where possible. Vacuums and on-tool extraction devices must have M or H class filters. On-tool extraction/water suppression devices must comply with and be maintained per the manufacturer's specifications. Water suppression is to be used where activities disturb respirable crystalline silica (silica dust) including demolition, ground works activities or sweeping where the risk of silica dust has been identified. Dust P2 masks (as a minimum) to be worn at all times in identified areas and masks to be fit tested. Identified areas will be communicated at daily prestart meeting on the relevant days. Rubble to cleaned up immediately. Slurry to be cleaned up immediately. When grinding concrete- •Area to be isolated with signage. •fans, large extraction systems or local exhaust ventilation (LEV) systems can be used to extract contaminated air from the work area, given it does not pose a risk to others outside of the work area. •Workers undertaking the grinding must wear either a reusable half face respirator, full face respirator (cartridge) or a full-face powered air purifying Respirator (PAPR) •Clothes to be vacuumed down to prevent the spread of silica dust.	2	2	Medium
Electricity								
Electrocution from faulty/ damaged electrical equipment	4	2	Medium	AS/NZS 3017: Electrical installations - Testing & inspection guidelines	All power tools/ leads must be visually checked daily and tested and tagged 3 monthly. Damaged leads and power tools are not to be used on site. Lead are to be elevated off the ground to minimise risk of electrical leads being damaged.	3	1	Low

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HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Electrocution from faulty/ damaged Distribution boards	4	2	Medium	- WHS Plan	HY DB Board checklist to be completed for all DB boards. All temporary distribution boards will be inspected, tested and tagged monthly. All RCD's to be padlocked and only reset by a qualified electrician. CoC to be issued for every board and attached to DB checklist	3	1	Low
Workers tripping on leads	3	2	Medium	AS/NZS 3199 Approval & test specification for cord extension sets	All power leads must be elevated off the ground. A maximum of 5m may be on the ground for general movements in the area whilst using the power tool.	2	1	Low
Electrocution from temporary construction wiring being damaged	4	3	High	NSW Low Voltage Electrical Work 2002	All temporary construction must be labelled with 'yellow temporary construction wiring tape'. All temporary construction wiring will be inspected.	3	1	Low
Working around energised live Substation	4	3	High	AS/NZS 3000: Electrical Installations	All substations to be fenced of using hard fencing. All subcontractors conducting excavation works must obtain a ground works permit from HY site staff. A plan with existing underground services must be attached to the permit. NDD to be implemented around services in the ground	3	1	Low
Workers piggy backing leads	3	2	Medium	AS 3012: Electrical Installations - Construction & Demolition Sites	Portable generators must be used if electrical leads cant reach from the DB board to the work area so a power source is close to the work area.	2	1	Low
Disruption to the facility from shutting down power without notification could have major implications	4	2	Medium	AS/NZS: 3000 Electrical Installations	Notice of disruption will be issued to the client prior to power being shut down	3	1	Low
Emergency Services Unavailability								
Injured person may not receive first aid treatment in a sufficient amount of time	1	3	Low	WHS Act 2011 Code of Practice: First Aid HY emergency response plan	Emergency contact details are displayed on the site safety notice board in the lunch shed and in the first aid room. All HY site staff have senior first aid training. There are 2 type A first aid kits in the site compound area. One is portable and one is fixed to the wall. There is a defibrillator in the first aid room. The first aid facilities have been setup in accordance with Code Of Practice: First Aid taking into account the number of workers on site, response times and types of injuries which may occur on site.	1	2	Low
Site Emergencies	2	3	Medium	WHS Regulation 2011	HY emergency response plan details actions to be taken for different types of emergencies	2	1	Low
Erosion/ Loss of Topsoil								
Sediment entering stormwater systems	3	1	Low	Environmental Protection Act 1994	All stormwater pits to be covered with sediment control fabric. Sediment barrier to be erected around the low perimeter of site perimeter fencing in accordance with the site sediment control plan. Sediment control to be inspected Fortnightly and recorded on the site HSE inspection report.	2	1	Low
Erosion causing site scaffolding to become unstable	3	2	Medium	- Environmental Management Plan	All site scaffolding when installed to be checked following significant rainfall and rectified by scaffolder as required.	2	1	Low

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ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	
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ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
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Existing services								
Damage to existing services could cause major disruption to the client e.g. live power, security cables etc.	2	3	Medium	NSW Code of Practice Excavation	Subcontractors are available on site to repair services if damaged	2	3	Medium
Plant operators striking underground services whilst undertaking trenching/excavation works	4	3	High	Endeavour Energy Safety Guidelines - Working near or around underground cables - WHS Plan	A ground works permit system is in place on this site. All known existing services have been marked up on the site plans. Pot holing and hand digging must occur when working around existing services. Striking existing underground services has been listed as a hazard on all subcontractor SWMS involving excavation works	3	1	Low
Excavators digging trenches accidently striking recently installed and charged up hydrant lines throughout the site	3	2	Medium	Jemena Guidelines Construction Activities Near & Over Jemena Gas Networks Assets - WHS Plan	A plan has been issued to all subcontractors notifying them of existing services	2	1	Low
Explosive Powered Tools								
Eye and hearing damage	3	1	Low	WHS Plan	Eye and hearing protection must be worn. Workers must be closely supervised by their supervisor	2	1	Low
Excavations								
Excavation over 1.5m	3	2	Medium	NSW Code Of Practice: Excavation 2000	All trenches over 1.5m must be benched at 1:1 at a maximum of 1.5m or battered at 45 degrees unless stated otherwise by a geotechnical engineers report. A ramp or steps must be cut into the trench for easy pedestrian access.Shoring boxes to be used for trenches greater than 1.5 m deep if benching is not possible	2	1	Low
Large stockpiles of spoil creating blind spots for plant operators and truck drivers	3	1	Low	NSW Code Of Practice: Moving Plant On Construction Sites 2004	Plant operators must neatly stockpile all spoil and limit the height of the stockpile to maintain good vision. Plant operators are to avoid stockpiling spoil next to bends on haul roads.	2	1	Low
Trench collapse trapping workers	4	3	High	AS 2763 Vibration and shock - hand transmitted vibration - guidelines for measurement and assessment of human exposure	Any trenching in unstable ground is to be benched/ battered. If the excavation reaches rock or shale and benching/ battering is not practical geotechnical engineers signoff is required. A ramp must also be cut into the end of trench for emergency access/ egress.	3	1	Low
Plant eg. mobile crane set up too close to a trench could result in trench collapse and plant roll over	3	2	Medium	- WHS Management Plan	All plant must be set up at least 1m outside of zone of influence	2	1	Low
Plant outriggers sinking into ground resulting in plant roll over.	4	3	High	AS 3798 Guidelines on earthworks for commercial & residential developments	Plant must only be set up on solid ground and sufficient pig sty packing/ sole plates placed underneath out riggers. Sole plates are to be used underneath EWP stabilizers if the ground is soft. Ground conditions to be constantly checked during and after rain fall.	3	1	Low
Open trenches restricting access for vehicles and pedestrians around site	3	2	Medium	NSW Dial Before U Dig Legislation	Pedestrian / vehicle/ plant access must be kept clear at all times around site. Alternative access routes are to be set up prior to trenching across pathways and roadways.	2	1	Low
Building materials/ stockpiles stored near trench could result in trench collapse	3	2	Medium		Materials and equipment must not be stored within the 'zone of influence'	2	1	Low

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HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Different trades working in the same area at the same time could strike each other with mobile plant	4	3	High		Daily pre-starts and SWMS detail how to work around moving plant on site including plant used by other trades eg. spotters, barricade the work area, signage etc	3	1	Low
Damage to existing buildings from vibrations caused by machinery	3	1	Low		Vibration from earthworks to be monitored by HY and subcontractors	2	1	Low
Formwork								
Formwork collapse	4	3	High	Code of Practice: Formwork	Formwork must be certified by a qualified engineer that it is structurally sound and able to safely support loads that may be applied by the concrete pour, workers, reinforcement & crane lifted loads. Once engineer's inspection complete ensure any additional back propping is installed if required. Place plant and materials on formwork and falsework only where allowed for by the design and when the structure or deck is sufficiently constructed so it is able to bear the load	2	1	Low
Fall from heights	4	3	High		Fall from height controls must be in accordance with the NSW COP Formwork. SC to provide HRCW SWMS. HRCW Planning - Formwork to be complete on Hammertech. Spread first section of joist on beam from intermediate work platform and only access the deck to start laying ply once the joist are down and handrail is in place. Use scaffold to gain access to deck to start laying plywood When you sheet up to 1.8m from end of joist lay next section of joist NEVER sheet to the end of the joist even if there is a catch deck in place Lay joist across bearers fixed at a spacing of 450 maximum to prevent any possibility of falls while construction of the deck. Establish working areas for steelfixers & other trades. A 'formwork only' zone should be maintained behind the leading edge. This zone should be clearly demarcated by signage and a barrier. Protect open penetrations with edge protection (e.g. handrails) or cover securely. Cast5in metal mesh with a small aperture (e.g. 50 x 50 mm mesh size or smaller) for small penetrations. Paint ply covers with appropriate warnings (e.g. "PENO" or similar) and fasten securely.	3	1	Low
Cuts/ impalement on starter bars	3	2	Medium		Safety caps to be fitted to all starter bars wherever there is a risk that a person may fall on one.	2	1	Low
Fall prevention/ arrest equipment								

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Failure of fall arrest equipment	4	3	High	HY emergency response plan AS/NZS 1891: Industrial fall arrest systems and devices	All safety harnesses and lanyards must be visually checked daily. Safety harness is the last form of control and other forms of fall protection should be used such as perimeter scaffolding, EWP, handrails etc Maintenance and inspection records in subcontractor safety management plans to be kept up to date Roof anchor points must be certified prior to use Rescue procedure for rescuing persons in fall arrest must be developed prior to persons using safety harnesses	3	1	Low

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HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Fall from heights								
Workers falling into open trenches	3	2	Medium	AS 1418.1: Cranes, hoists and winches – General Requirements	All open trenches must be bunted off at least 1m from the edge of the trench. Where there are high movements of pedestrians an plant then a solid barrier such as a temporary mesh	2	1	Low
Workers falling into open penetrations (eg in-ground pits)	4	3	High	WHS Regulation 2011 Part 4.4 Falls	All penetrations to be covered with and secured and the wording "peno" or "do not remove" sprayed onto the plywood.	2	1	Low
Personnel falling into open trenches or off the edges of batters and excavations	2	3	Medium		All open trenches and along the top edge of batters must be bunted off at least 1m from the edge of the trench. Deep trenching must be benched every 1.5m so that a person can only fall a maximum of 1.5m.	2	1	Low
Workers falling from ladders	3	2	Medium	NSW Code Of Practice: Managing the risk of falls at workplaces	Ladders are to used in accordance with the HY ladder policy. Ladders are the last resort for height access and other means of height access should be used eg EWP's, mobile scaffolding, platform ladders etc. Standard A frame ladders can be used but only for short duration works or tight restricted spaces such as small rooms where a scissor lift will not fit. Ladders with 4 steps or less are not permitted on site	2	1	Low
Fall from scaffold	4	3	High	AS 1576: Scaffold general requirements	Modular stairs to be installed at the same time as decks are installed for safe access to each deck. Handrails must be installed from deck below prior to accessing the deck above. Ends must be closed off with trannys. Scaffolder will erect 'danger scaffold incomplete' signage until the scaffold is ready for use and a handover certificate has been issued to HY. All trades have been made aware not to alter the scaffold under any circumstance.	2	1	Low
Fall from mobile scaffold	3	2	Medium	Scaffold erection guide (comes with scaffold)	All mobile scaffolding must be built as per the manufacturers instructions. Handrails and midrails must be in place. Any scaffold where a person can fall more than 4m must be erected by a licenced scaffolder.	2	1	Low
Workers falling from heights	3	2	Medium	- WHS Plan	Roof access permit must be obtained by the roofer prior to accessing the roof. Perimeter scaffold or handrail must be in place for fall protection. Safety mesh must be installed correctly as per HY requirements	2	1	Low
Falls into bored piers	3	2	Medium	AS/NZS 1892 Portable Ladders	Bored piers must be fully covered with mesh to eliminate risk of workers falling into the hole. Deep excavation signs are to be erected and the are fully bunted off. Best practice is to fill the hole with concrete as soon as possible.	2	1	Low
Falling objects								
Pallets of materials stacked too high could tip over and injure a person	2	3	Medium	Workcover Bricklayers guide	Pallets of material must be stacked on level ground no more than 2 pallets high	2	1	Low
Scaffold parts could fall/ be knocked off the deck and injure workers below	3	2	Medium	AS 1576: Scaffold general requirements	All excess scaffold material must remain on the ground. No excess scaffold material is to be left lying on scaffold decks	2	1	Low
Formwork and reo materials falling from deck onto persons below	4	3	High		All FRP materials must be stacked neatly clear from edge of deck. If this is not possible then kick boards must be put in place	3	1	Low

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PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment	**Likelihood**	**Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant**					
PROJECT:	**Newcastle High School Redevelopment**		1	2	3	4	5	
JOB NO:	**SN111**	5	Medium	High	High	High	High	Likelihood 1- Very unlikely 2- Remotely possible 3 - Possible 4 - Likely - 5 - Very Likely
		4	Medium	Medium	High	High	High	
ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	
		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Building material and tools falling from scaffold decks	3	2	Medium	- WHS Plan	Edge boards to be fitted to all scaffold decks. Materials stored on scaffolding is to be kept to a minimum and removed from decks daily. If possible do not store materials on scaffold.	2	1	Low
Falling materials from EWP's	4	3	High	AS/NZS 2210 Occupational protective footwear	No worker is to walk underneath an elevated EWP. All EWP operation must have a spotter or the area must be fully barricaded off with bunting or flagging or signage in place	3	1	Low
Loose materials and rocks from walls of trenches falling onto workers within the trench	3	2	Medium	AS/NZS 1800 Occupational protective helmets - Selection, care & use	No access to any open trenches for workers unless the walls of the trench are stable. Geotech sign off required for trenching over 1.5m	2	1	Low
Materials left behind after works finish eg. loose bolts, off cuts etc	4	3	High	AS/NZS 1801 Occupational protective helmets	Work areas at heights must be checked daily and loose items brought down to ground level.	3	1	Low
Fauna (protected or endangered species)								
Snakes and insects in long grass	2	2	Medium	Environmental Protection Act - Environmental Management Plan	Weeds and long grass alongside pedestrian pathways around the site are to be cut back with a wipper snipper	2	1	Low
Fire								
Chemical and fuel spills may cause a fire	4	2	Medium	Emergency Response Plan	A;BE Powder type fire extinguishers are installed at several locations strategically placed around the site	3	1	Low
Sparks from hot works eg welding, grinding may cause a fire	3	2	Medium	AS 2444: Portable fire extinguishers & fire blankets - selection and location AS/NZS 1850 Portable fire extinguishers - Classification, rating and performance testing	All subcontractors must obtain a hot works permit from HY staff. The permit will detail any controls required for undertaking the task	2	1	Low
Flammable materials stored on site may ignite from hot works in the area	3	2	Medium	NSW Code of Practice: Control Of Workplace Hazardous Substances	Hazardous materials must be stored in cool, dry areas away from ignition sources and flammable material signage installed.	2	1	Low
Fuel drums could catch on fire from sources of ignition	4	2	Medium	AS 3745 Emergency control organisation and procedures for buildings, structures and workplaces	Fuel drums are to be put away when not in use in a storage cage in a well ventilated area	3	1	Low
Workers could be seriously injured whilst attempting to extinguish fire	1	5	Medium		All workers are told at site induction not to place themselves at risk and not to try and fight the fire. Only trained personnel to fight fires.	1	3	Low
Time taken to obtain fire extinguisher in the event of an emergency	3	2	Medium	AS/NZS 1841 Portable fire extinguishers	Fire extinguishers are places strategically around site for easy/ fast access. Locations of fire extinguishers are on the site layout plan	2	1	Low
Poor maintenance of fire extinguishers	2	2	Medium	AS 2375 Guide to the selection, care & use of clothing for protection against heat & fire	Fire extinguishers are to be tagged every 6 months by a competent person	2	1	Low
Breach of Total Fire Ban	3	2	Medium	AS 1851 Maintenance of fire protection systems & equipment	Hansen Yuncken have appiplied to the local Fire Brigade in writing for an exemption. This has been approved as per Schedule 14 (D) of the NSW Government Gazette No. 11	1	1	Low

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		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
First aid								
Persons unaware of what to do if an individual requires first aid	2	1	Low	WHS Regulation 2011	Emergency response plan available to all workers. All workers explained of the location of the first aid room and contact details for site first aiders.	1	1	Low
Injured person not receiving first aid treatment quickly enough due to the site being so large	2	2	Medium	Work injury management and workers compensation act 1988	Site staff to communicate by way of mobile phones and 2 way radios. A first aid room is set up in the HY compound area. Within the first aid room is a fixed type A kit and portable type A kit for rapid response.	1	1	Low
It may not be possible to take the injured person to the first aid room because of the seriousness of their injuries	1	3	Low	First aid in the workplace: Code of Practice: July 2012	Access routes to be kept clear around site for emergency vehicles	1	2	Low
Inadequate first aid supply's	1	3	Low	- WHS Plan	First aid room to be set up with portable and fixed first type A first aid kits, stretcher, defibrillator, ice packs, sun cream, eye wash and examination couch	1	2	Low
Inadequately trained first aiders/ insufficient number of first aiders	1	3	Low	Emergency Response Plan	HY to ensure enough site team are trained first aiders. Ratio of first aiders to workers as per code of practice - First aid in the workplace.	1	2	Low
Persons working alone unable to raise the alarm	1	3	Low	Emergency Response Plan	No person is to work alone. There must be another person in the area at all times. This is told to all workers at site induction	1	2	Low
Heart attack/ stroke	2	3	Medium	Emergency Response Plan	Defibrillator to be kept in first aid room	1	2	Low
Number of buildings	1	2	Low	Emergency Response Plan	1 buildings - All easily accessible for pedestrians or vehicles	1	1	Low
Maximum Number of levels on each building	1	2	Low	Emergency Response Plan	Internal stair access	1	1	Low
Time taken to walk to furthest point on site	1	3	Low	Emergency Response Plan	3 minutes - from first aid room to furthest point on site	1	2	Low
Nearest Hospital	1	3	Low	Emergency Response Plan	John Hunter Hospital	1	2	Low
Nearest Medical centre	1	3	Low	Emergency Response Plan	Heal Specialsit Urget Care	1	2	Low
Maximum time to medical service	1	3	Low	Emergency Response Plan	10 minutes	1	2	Low
Maximum number of workers	1	3	Low	Emergency Response Plan	>100	1	2	Low
Number of other persons	1	3	Low	Emergency Response Plan	Expected to have a maximum of 3-4 at any one time	1	2	Low

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		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Site hours	1	3	Low	Emergency Response Plan	7:00am - 6:00pm Monday - Friday 7:00am - 5:00pm Saturday. No Works on Sundays or Public Holidays. A first aid qualified person from Hansen Yuncken is on site at all times	1	2	Low
Average hours worked by a worker	1	3	Low	Emergency Response Plan	Workers generally work 8-9 hours per day	1	2	Low
Remote or isolated works	1	3	Low	Emergency Response Plan	Workers are not permitted to work alone. There must be atleast 2 workers in the same area at all times. Due to the nature of the site it is unlikely any worker will be isolated or work alone	1	2	Low
Types of injuries over the last 12 months	1	3	Low	Emergency Response Plan	Majority of types of injuries include: cuts and abrasions, minor eye injuries, sprains and strains.	1	2	Low
Other	1	3	Low	Emergency Response Plan	Occasionally workers have fallen ill (not work related) however these people are sent to a Doctor for further treatment	1	2	Low
Cuts and abrasions	2	3	Medium	Emergency Response Plan	Type A first aid kit has contents for treating these types of injuries	1	2	Low
Sprains and strains	1	3	Low	Emergency Response Plan	Ice packs and instant cold packs to be available	1	2	Low
Eye injuries	2	3	Medium	Emergency Response Plan	Eye wash station to be set up in first aid room	1	2	Low
Burns	1	3	Low	Emergency Response Plan	Burn cream and non adherent wound dressings	1	2	Low
Fractures	1	3	Low	Emergency Response Plan	Type A first kit and a stretcher for moving injured workers	1	2	Low
Dislocations	1	3	Low	Emergency Response Plan	Type A first aid kit has triangle slings	1	2	Low
Poisoning and toxic effect of substances	1	3	Low	Emergency Response Plan	Safety data sheets available for all substances used. Oxy viva system to be kept in first aid room	1	2	Low
Heat stroke	1	3	Low	Emergency Response Plan	Ice packs and cold water on standby. Subcontractors have been addressed at side induction to take breaks, work in shade wherever possible., job rotation etc	1	2	Low

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RELEVANT PROCEDURE:	Project HSE Risk Assessment
PROJECT:	**Newcastle High School Redevelopment**
JOB NO:	**SN111**
ASSESSED BY:	Robert Petersen
ASSESSMENT DATE:	14-Mar-24

Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
	1	2	3	4	5
5	Medium	High	High	High	High
4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

HAZARD (Include additional project specific hazards as required)	**RISK ASSESSMENT** L	C	Class	**CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)** Legislation, Standards & Codes of Practice	Enter Details of Specific Controls Required	**RESIDUAL RISK ASSESSMENT** L	C	Class
Ground Collapse/poor ground								
Plant roll over from sinking in unstable ground conditions	3	2	Medium	- WHS Plan	Subcontractors to complete a plant risk assessment prior to operating plant. Plant will not be operated in unstable ground conditions. If the ground is too soft or uneven then the ground will be bladed back to solid ground prior to plant operating on it. All subcontractors must obtain a HY plant setup permit prior to operating plant with outriggers. Concrete boom pumps and mobile cranes must obtain a geotechnical engineers report stating the ground is stable and able to take the weight of the crane and load being lifted. Site to be inspected by the Site Manager and HSR following heavy rain prior to work commencing the next day	2	1	Low
Vehicles/ plant could become bogged in soft muddy ground	3	3	Medium	National Standard For Plant: 10:10 (1994)	Temporary roadways have been rolled and compacted to keep ground stable, No plant to work on unstable ground accessed in wet weather prestart to be conducted after each inclement weather event	2	1	Low
Pedestrian slip and trip hazards from muddy/ uneven ground	3	2	Medium	- WHS Plan	Crusher dust has been spread over pedestrian pathways to minimise slip and trip hazards. Plant is to be used to blade back ruts and muddy ground to minimise slip and trip hazards for workers in the area particularly on rain days	2	1	Low
Trucks and vehicles tracking mud and dirt onto road from muddy tyres	3	2	Medium	- WHS Plan - Environmental Management Plan	Shaker grid installed at site entrance. High pressure water blaster to be used ton wash tyres where required.	2	1	Low
Pedestrians/ workers tripping over in deep wheel ruts left by plant movements	3	2	Medium	- WHS Plan	Wheel ruts are to be bladed/ levelled out to minimise trip hazards around site	2	1	Low
Hazardous Chemicals								
Spillage of fuels and chemicals	3	2	Medium	AS 1940: The storage and handling of flammable and combustible liquids - Environmental Management Plan	A spill kit is kept in the site office. Any drums of fuel larger than 20 litres must be bunded. All trades are to set up a hazardous substance storage are next to their site containers with signage erected 'no smoking', 'Danger Fuel Storage area' etc	2	1	Low
Unsafe storage of oxy acetylene equipment	3	2	Medium	AS 4332 The storage and handling of gases in cylinders - Environmental Management Plan	Oxygen and acetylene bottles are to be stored in separate ventilated cages 3m apart at the end of each day and appropriate warning signage erected.	2	1	Low
Mix matched storage of hazardous substances could cause a chemical reaction	3	2	Medium	NWHSC 2017 - 2001 Storage & Handling of Dangerous Goods	Only substances of the same class can be stored together as per the Safety Data sheet for the products	2	1	Low
Heat stress								
Sun burn	3	1	Low	NSW Code Of Practice Work in hot or cold environments 2001	Sun cream is available in the site office. Singlets are banned. Workers are encouraged at the site induction to wear long sleeve pants and shirts.	2	1	Low
Hot temperatures may cause persons to become dehydrated resulting in illness, headaches, fainting etc	2	1	Low	NSW Hot & Cold Environments 2001	Air conditioned lunch sheds. Subcontractors to work in shaded area wherever possible.	1	1	Low
Hot Works								

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		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Sparks from welding, grinding or using oxy acetylene may cause a fire if flammable materials are in the area	3	2	Medium	AS 1674: Safety in welding and allied processes	A hot works permit must be obtained by the subcontractor.. All sources of ignition to be removed from the area prior to hot works occurring	2	1	Low
Fire and injury to others from persons using angle grinders	3	2	Medium	- hot works permit	Conduct all grinding away from flammable materials and other workers I the area. Be ware of direction of flying sparks	2	1	Low
Welders flash to other trades	3	2	Medium	- WHS Plan	Welding screens and warning signage must be erected to protect other trades from welders flash if others are within a 10m radius of the work area	2	1	Low
Hygiene (poor)								
Unhygienic facilities could result in workers becoming ill and contracting diseases	2	3	Medium	NSW Code Of Practice: Managing the work environment and facilities	A cleaner has been engaged by Hansen Yuncken to clean amenities. All amenities to be kept clean and rubbish bins emptied daily.	3	1	Low
Trades not putting rubbish and off cuts in bins provided creating trip hazards	2	1	Low	NSW Code Of Practice: Amenities for construction work 1997	Improvement notices to be issued to subcontractors who do not keep the site neat and tidy	1	1	Low
Inadequate facilities for general site rubbish	2	1	Low	- WHS Plan	Skip bins/rubbish bins to be placed on site at various locations and changed over regularly	1	1	Low
Lifting Over Public Outside Site								
Injury to pedestrians/ public	1	4	Medium	WHS Plan	No lifting of building materials outside of the construction fence unless traffic control and diversions are in place and the subcontractor has seeked approval from the HY Site Manager	1	2	Low
Manual Handling								
Back injuries/sprains and strains	3	2	Medium	HY Glove and clip policy	Team lifts for heavy items. Mechanical aids eg. telehandler to be used wherever possible. Building material to be dropped off as close to the work area as possible to minimise carrying distance. Follow c orrect manual handling techniques	2	1	Low
Cuts to hands	3	2	Medium	WHS Regulation 2011 Part 4.2 Hazardous Manual Tasks	Gloves to be worn for manual handling tasks as per Hansen Yuncken glove & clip policy	2	1	Low
Back injuries/sprains and strains	3	2	Medium		Block and tackle use - Use of block, tackle and slings is to be used in accordance with SWMS. Slings are to wrapped around a solid structure only. Slings to be wrapped by dogman and riggers only	2	1	Low

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ASSESSMENT DATE:	14-Mar-24

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4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
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Likelihood
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HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Mobile Plant								
Mobile plant could strike a pedestrian worker on site	4	3	High	NWHSC 1010: National Standard for Plant	All trades are warned of moving plant at the site induction. High vis vests are to be worn at all times. All workers on site must keep well clear of plant on site and gain the operators attention prior to approaching any plant. Only workers involved with the task are to be with in the work areas of plant. People working within the work area of plant must be visible to the operator at all times.	3	1	Low
Mobile plant could crash into a structure or open trench	3	2	Medium	- WHS Plan	Trained, experienced, qualified workers to operate plant only. Plant operator competency statement to be issued to HY for any plant which does not require a legislated ticket.	2	1	Low
Pedestrians/ workers being struck by mobile plant	4	3	High	AS 2294 Earth moving machinery - Protective Structures AS 4602 High Visibility Safety Garments	A combination of controls must be put into place and detailed in sub contractors SWMS eg. barricade the area (orange flagging), erect signage, use a spotter etc. Bunted off pedestrian pathways have been erected on site to keep pedestrians clear of areas where there are high movements of vehicles/ trucks and plant. All subcontractors using moving plant must have a SWMS which details how to protect other workers in the area from being struck by the plant. All plant must have a flashing light, horn and reversing beeper. Vehicles/ trucks must turn their flashing lights on. There is a 10km/h speed limit on site. All workers have been told at the site induction to be aware of moving plant on site and keep clear whenever possible. Only workers who are involved with the task are to be in the vicinity of the plant. HY have instructed all subcontractors to train their workers through pre-start meetings on how to approach moving plant and equipment. Access routes for plant and vehicles are to be maintained. Pedestrians are to walk along the side of access routes whenever possible. Plant operators are to keep reversing to a minimum. Pedestrians that need to approach moving plant are to do so from the front of the machine and are to gain the operators attention by making verbal conatct and eye contact with the operator. No person is to approach the machine until the operator has stopped moving the machine and signalled that it is safe to approach. Spotters working with machines must always stand in an area where they are visible to the operator.	3	1	Low
Plant roll over on unstable ground	3	2	Medium	Model Code of Practice - Managing the Risks of Plant in the Workplace	Plant operator and HY site staff must assess conditions and determine if the ground is stable for plant. If the plant has out riggers then they must be fully extended. Subcontractors must obtain a 'plant setup permit' from Hansen Yuncken prior to setting up any plant with outriggers eg. concrete boom pumps, cranes, frannas etc	2	1	Low
Possibility of scissor lift being driven off edge of concrete slab resulting in scissor lift tipping over	3	2	Medium	Model Code of Practice - Managing the Risks of Plant in the Workplace	A timber bump stop must be installed to the edge of the slab whenever EWP's are used close to the edge of a slab	2	1	Low

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ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	
		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Crushing Injury from scissor or boom lift	4	3	High	Model Code of Practice - Managing the Risks of Plant in the Workplace	Provide onsite training, Instruction and supervision Pre starts and Toolbox talks to be done as consultation with person's affected by the controls outlined. Only person's with EWP ticket to operate EWP No Person to work isolated or alone on an EWP 2 person team as a minimum , whilst using a EWP, 1 person to spot and also assist with task All Personnel to be trained by a qualified person on the specific EWP, Prior to use, completion of a logbook check is to be done All faults are to be immediately reported to supervisor and machine is to be tagged out Personnel using EWP must be aware of the emergency response protocol of that specific EWP Person operating EWP must be able to communicate clearly to spotter/work partner(team) Secondary protective device must be fitted to boom type EWPs. Cover on controls of scissor lifts to prevent unintentional operation	3	1	Low
Needle stick Injury								
Injured person could contract a disease	3	2	Medium	NSW Code Of Practice: HIV and other blood-born pathogens in the workplace	Workers injured by needle stick to be sent to the nearest medical centre	2	1	Low
Workers unaware of what to if a needle is found	3	1	Low	- WHS Plan	Workers to be told at site induction that if they find a needle on site they are not to touch it and report it to HY staff immediately	2	1	Low
Inadequate disposal facilities for needles found on site	3	1	Low	NSW: Code Of Practice: Work Place Amenities	Sharps clean up kit to be kept in site office at all times	2	1	Low
Noise								
Hearing damage from general construction noise eg. power tool usage, jack hammering etc.	3	2	Medium	AS/ANZ 1269: Occupational Noise Management WHS Plan	Hearing protection to be worn when using power tools or loud equipment. Signage to be erected to warn other trades of excessive noise. A noise monitor is available in the site office. The noise monitor is available for use on site safety walks	2	1	Low
Disruption to client and neighbours	3	1	Low	NWHSC 1007 - 2000 National Standard for Occupational Noise NWHSC 2009 - 2004 Noise Mgt & Protection of Hearing at Work	Notice of disruption to be issued to client if required. Work to be conducted within approved hours of DA contract only	2	1	Low

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PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment
PROJECT:	**Newcastle High School Redevelopment**
JOB NO:	**SN111**
ASSESSED BY:	Robert Petersen
ASSESSMENT DATE:	14-Mar-24

Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
	1	2	3	4	5
5	Medium	High	High	High	High
4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

HAZARD (Include additional project specific hazards as required)	**RISK ASSESSMENT** L	C	Class	**CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)** Legislation, Standards & Codes of Practice	Enter Details of Specific Controls Required	**RESIDUAL RISK ASSESSMENT** L	C	Class
Plant & Equipment								
Plant failure may cause serious injury to workers	3	2	Medium	NWHSC 1010: National Standard for Plant	HY plant verification reports to be completed for all plant. Maintenance records to be submitted to HY as evidence machine is safe for operation. Plant risk assessments to be conducted for all high risk work. Plant operators must conduct pre-start safety inspections of their machine daily and report faults to their supervisors	2	1	Low
Poorly maintained ladders and scaffolding failing/ collapsing	3	2	Medium	AS/NZS 1892: Portable Ladders	No timber ladder on HY sites. Ladders must be in good condition. Electricians must use fibre glass ladders. All workers are aware of the HY ladder policy posted on the wall in the lunch shed. Extension ladders must be tied off at the top landing. Scaffolding to be visually checked daily and full inspection monthly or after adverse weather	2	1	Low
Use of damaged ladders	3	2	Medium	AS 4576: Guidelines for scaffolding	Ladders to be checked for damage weekly on the site safety walk	2	1	Low
Lifting gear failure	4	2	Medium	AS/NZS 4994: Temporary edge protection	All lifting gear: soft slings, lifting chains must be visually checked daily prior to use for damage. Damaged lifting gear is to be withdrawn from service.	3	1	Low
Scaffold collapse/ fall from scaffold	3	2	Medium	AS/NZS 1891.1 2007 Industrial fall arrest systems - harnesses and ancillary equipment	Scaffold handover certificate to be issued to HY prior to anyone accessing the scaffold. Scaffold to be inspected minimum monthly and after heavy rain. Scaffold will also be inspected on a monthly basis. Mobile scaffolds to be built as per manufacturers instructions. Scaffold where a person can fall more than 4m must be erected by a licenced scaffolder. No person is to alter the scaffold what so ever. Any issues with scaffold is to be reported to the Site Manager immediately.	2	1	Low
Multiple mobile plant interaction/ contact	4	2	Medium	- WHS Plan	Plant operators must communicate by way of 2 way radios, eye contact and spotters	3	1	Low
Vehicle and plant exhaust fumes	2	1	Low	HY ladder policy	Use of electric scissor lifts inside buildings only. All other diesel powered machines are used in open well ventilated areas	1	1	Low
Post Tensioning								
Accidental drilling or cutting PT cable	4	2	Medium		All subcontractors to obtain cutting/coring permit. This permit will detail location of PT cables if applicable.	2	2	Medium
Plant & Equipment Washout								
Water from cleaning plant and equipment creating a muddy/ slippery surface	3	2	Medium	Environmental Protection Act 1994	Washout area to be determined on a daily basis as the site changes. The wash out area must not allow water to flow over pedestrian foot paths	2	1	Low
Muddy and contaminated water entering stormwater system	3	2	Medium	HY environmental management plan	Sediment control to be placed around the washout area	2	1	Low
Pressurised Gas Mains								

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Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
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5	Medium	High	High	High	High
4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
2	Low	Medium	Medium	Medium	High
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Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Excavator buckets striking undergroiund gas lines	2	3	Medium	WHS Plan	A permit to dig system is in place on this site. All known existing services have been marked up on the site plans. Pot holing must occur when working around existing services. Only toothless buckets are to be used when digging in the vicinity of gas lines. Striking existing underground services has been listed as a hazard on all subcontractor SWMS involving excavation works	1	3	Low
Scaffold								
Fall from heights over 2m	4	3	High	WHS Regulation 2011: Part 3.1 Managing risks to health and safety	Use scaffold, scaftags in place. Scaffold erected by qualified persons. Montly inspections in place.	3	1	Low
Insufficient egress from building in the event of an emergency	3	2	Medium	AS1576: Scaffold general requirements	Ensure there is sufficient egress from the building and egress size is compliant.	2	1	Low
Possible scaffold overload resulting in scaffold collapse - materials and workers	3	2	Medium	- WHS Plan	Compy with load limits on scaffold at all times.	2	1	Low
Scaffold sinking into soft ground compromising structural integrity	3	2	Medium	- WHS Plan	Ground to be inspected prior to instalation, ensure baseplate are of sufficient size and ground capacity is capable of supporting weight of scaffold.	2	1	Low
Sediment and erosion control								
Mud, dirt and sediment polluting stormwater systems	3	2	Medium	Environmental Protection Act 1994, Construction Environmental Management P	Project Sediment Erosion Control plan. Silt barriers to be installed around low areas of site to catch all rain fall. All stormwater pits to be covered in silt control. All vehicles tyres must be washed clean of mud prior to leaving site via truck wash. Silt socks to be placed in front of stormwater drains in gutters.	2	1	Low
Mud & dirt tracking onto public roads	3	2	High	- Construction Environmental Management Plan	Shaker grid installed at site entrance. High pressure water blaster to be used ton wash tyres where required.	2	1	Low

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			Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
RELEVANT PROCEDURE:	Project HSE Risk Assessment			1	2	3	4	5
PROJECT:	**Newcastle High School Redevelopment**		5	Medium	High	High	High	High
JOB NO:	**SN111**		4	Medium	Medium	High	High	High
ASSESSED BY:	Robert Petersen		3	Low	Medium	Medium	High	High
			2	Low	Medium	Medium	Medium	High
ASSESSMENT DATE:	14-Mar-24		1	Low	Low	Low	Medium	Medium

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Site Lighting								
Sun glare restricting plant operators visibility	3	2	Medium	WHS Regulation 2011	Sunglasses to be worn by plant operators as required. Certain tasks may also be conducted at different times of the day to stop the sun becoming an issue.	2	1	Low
Lighting (Poor)	3	2	Medium	NSW Code Of Practice: Managing the work Environment and Facilities	Ensure that task area has adequate natural light and if natural light is not adequate provide artificial lighting	2	1	Low
Slips/Trips								
Workers slipping or tripping on rough/ uneven/ muddy/ slippery ground	3	2	Medium	AS/NZS 2210 Occupational protective footwear - WHS Plan	Pedestrian pathways to be kept clear of rubbish and material. Safe access around site to be maintained at all times. Gravel/ crusher dust to be placed on slippery/ muddy surfaces. Blading back of ruts and muddy ground conditions to be conducted as required. Bunted off pedestrian pathways are installed around main access routes throughout site for safe pedestrian access, this way people can use the pathway then branch out to their specific work area with minimal risk of slipping over in muddy conditions	2	1	Low
Structural Support								
Masonry walls collapsing in high winds	3	2	Medium	National Code of Practice for Precast, Tilt Up and Concrete Elements in Building Construction 2008	Masonry walls must be adequately braced with timbers every 2m until core filled	2	1	Low
Formwork collapse	4	2	Medium	AS 3850:Tilt Up Concrete Construction	Engineers sign off required to pouring of any concrete	3	1	Low
Precast concrete panel collapse if structural steel is inadequately braced	4	3	High	NSW Code of Practice: Formwork 1998	Structural steel must be signed off by engineer prior to installation of precast concrete panels	3	1	Low
Structural steel collapse	4	3	High	AS 4991: Lifting devices	Structural steel must be erected by qualified dogmen and riggers. Erection sequence to be subbmited by SC and reciewed by engineer. Subcontractor must submit ITP's to Hansen Yuncken. Hansen Yuncken to complete QC Compliance audit report.	3	1	Low
Synthetic fibres								
Unsafe handling of roof insulation	3	2	Medium	NSW Code of Practice: Safe use of synthetic mineral fibres	Install roof insulation as per Safety Data Sheet and SWMS	2	1	Low
Temperature Extremes								
Dehydration	3	1	Low		Workers are encouraged to drink plenty of water. Water bubbler available at site lunch sheds	2	1	Low
Sunburn	3	2	Medium		Workers must wear are shirt on site. Singlets are not allowed. Sun cream is available to everyone and is kept in the site office	2	1	Low
Heat stress	3	2	Medium		Workers are encouraged to work in the shade wherever possible and take regular breaks whenever required.	2	1	Low
Tilt –up or Precast Concrete Work								

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RELEVANT PROCEDURE:	Project HSE Risk Assessment			**Likelihood**	**Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant**			
PROJECT:	**Newcastle High School Redevelopment**				1	2	3	4	5
JOB NO:	**SN111**			5	**Medium**	**High**	**High**	**High**	**High**
				4	**Medium**	**Medium**	**High**	**High**	**High**
ASSESSED BY:	Robert Petersen			3	**Low**	**Medium**	**Medium**	**High**	**High**
				2	**Low**	**Medium**	**Medium**	**Medium**	**High**
ASSESSMENT DATE:	14-Mar-24			1	**Low**	**Low**	**Low**	**Medium**	**Medium**

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			**CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)**		**RESIDUAL RISK ASSESSMENT**		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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PROJECT HSE RISK ASSESSMENT

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RELEVANT PROCEDURE:	Project HSE Risk Assessment
PROJECT:	**Newcastle High School Redevelopment**
JOB NO:	**SN111**
ASSESSED BY:	Robert Petersen
ASSESSMENT DATE:	14-Mar-24

Likelihood	Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant				
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4	Medium	Medium	High	High	High
3	Low	Medium	Medium	High	High
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Likelihood
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	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Traffic Management								
Vehicles/ trucks speeding on site	3	2	Medium	AS 1742.3-2009: Manual of uniform traffic control devices - Traffic control for works on roads	10km/h speed limits signs are erected around site. Drivers must give way to pedestrians. Delivery driver inductions for all drivers entering site. Hazard or flashing lights must be turned on	2	1	Low
Vehicles parking and blocking access roads	3	2	Medium		Vehicles to be used for loading/unloading purposes only are allowed on site and are to be parked off site if not required for work purposes.	2	1	Low
Blind spots creating collisions between vehicles	2	1	Low		Warning signs to be placed at blind spots	1	1	Low
Pedestrians entering site being struck by trucks and vehicles	4	3	High		Pedestrian access to site from main entrance on Laman Street only.	3	1	Low
Tree Lopping								
Tree Lopping - Falls	3	3	Medium	WHS Plan	Area to be delineated and HRCW for falling from heights and Plant and Equipment	1	3	Low
Vehicle & plant exhaust fumes								
Workers overcome by exhaust fumes from plant	3	2	Medium	NSW Code of Practice: Control Of Workplace Hazardous Substances	Plant to be operated in open areas with good ventilation only. Electric scissor lifts to be used inside buildings only. No petrol/ diesel powered equipment used inside buildings	2	1	Low
Ventilation (poor)								
Workers overcome by fumes when using chemicals	3	1	Low	NSW Code of Practice: Control Of Workplace Hazardous Substances AS/NZS 1715 Selection, use and maintenance of respiratory protective devices AS/NZS 1716 Respiratory protective devices	MSDS to be read and understood by all workers prior to work commencing	2	1	Low
Violence								
Workers arguing and fighting	3	1	Low	Violence in the workplace guide 2002	Zero tolerance for fighting on site - instant dismissal	2	1	Low
Waste Management/ Littering								
Inadequate bins on site to dispose of rubbish	3	1	Low	WHS Act/ Regulation 2011	Skip bins to be placed at various locations around site which are easy to access. Bins for food scraps are to be placed at the front of all lunch sheds	2	1	Low
Bins attracting rodents	2	1	Low		Food scrap bins to be bagged and changed regularly	1	1	Low
Having to walk long distances to dispose of rubbish	2	1	Low		Numerous skip bins to be on site close to all work areas	1	1	Low
Workers littering the site with rubbish and off cuts instead of disposing of rubbish in bins provided	2	1	Low		Suspension/ improvement notices to be issued to subcontractors who leave the site untidy	1	1	Low

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RELEVANT PROCEDURE:	Project HSE Risk Assessment	**Likelihood**	**Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant**					
PROJECT:	**Newcastle High School Redevelopment**		1	2	3	4	5	Likelihood 1- Very unlikely 2- Remotely possible 3 - Possible 4 - Likely - 5 - Very Likely
JOB NO:	**SN111**	5	Medium	High	High	High	High	
		4	Medium	Medium	High	High	High	
ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	
		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Water Contaminants								
Clean water around site becoming contaminated with mud	3	1	Low		Clean rain water is diverted around site by way of swales and sediment control	1	1	Low
Working at Height above 2m								
Workers dropping tools and material onto persons below	4	3	High	NSW Code of practice: Safe work on roofs part 1	"Danger workers above" signage to be erected. If there are other trades in the immediate area then red/white tape will be erected to create an exclusion zone - tools to be fastened on if possible to workers at all times.	3	1	Low
Scaffolders falling from heights during erection process	4	3	High	WHS Regulation 2011 Part 4.4 Falls	Install handrail, mid-rails and toe-boards where scaffolders are working from deck below while building using the approved control methods such as the 1m rule or Advanced guardrail systems	2	1	Low
Perimeter scaffold collapse	3	4	High		Check and confirm the suitability of the subgrade prior to basing out the scaffolding Confirm areas where trenches have been laid Visually check ground for stability, use sole boards where required or get others to compact areas Do not allow scaffold to exceed 4.0 m in height without being tied to the structure and braced or stabilised to an approved design Do not allow standards to be erected and left unsupported Each standard will be braced in a minimum of two directions. A brace is defined as a ledger or transom Scaffolds from which a person can fall more than 4 metres must be constructed and certified by a licensed scaffolder. Secure materials at height & isolate area below where there is risk of falling objects causing injury to persons below. No scaffold alterations are to be undertaken except by licensed scaffolder. Close off access to incomplete scaffolds, for example, install tube barricades and warning signs "Scaffold Incomplete" Ensure all scaffold is checked and secure before issuing handover docket and attaching Scafftag.	2	4	Medium
Workers falling from roof	4	4	High	NSW Code of practice: Safe work on roofs part 1	Roof access permit must be obtained by the workers prior to accessing the roof. Perimeter scaffold or handrail must be in place for fall protection. Safety mesh must be installed correctly as per Code Of Practice: sign off certificate must be provided to Hy before commencment of works - Safe Work On Roofs: Part 1.	3	1	Low
Mobile scaffold collapse	4	3	High	NSW Code of Practice: Managing the risk of falls at workplaces	Ensure scaffold is setup on stable ground and appropriate soles plates are installed by a competent person only. Install to manufacturers specifications.	3	1	Low
Fall from ladder	3	2	Medium	AS/NZS 4488 Industrial rope access systems - Selection, use & maintenance	Ladders must be used in accordance with HY ladder policy. Platform ladders only to be used.	2	1	Low
Fall from EWP/ boom lift	4	3	High	AS/NZS 1891 Industrial fall arrest systems & devices AS/NZS 4994 Temporary edge protection	WP ticket required to operate boom lift >11m . EWPAA yellow card required for EWP <11m. Ground conditions to be checked prior to operation. Harnesses and lanyards must be maintained and kept in good condition	3	1	Low

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PROJECT:	**Newcastle High School Redevelopment**		1	2	3	4	5	Likelihood
JOB NO:	**SN111**	5	Medium	High	High	High	High	1- Very unlikely
		4	Medium	Medium	High	High	High	2- Remotely possible 3 -
ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	Possible 4 -
		2	Low	Medium	Medium	Medium	High	Likely - 5 -
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	Very Likely

	RISK ASSESSMENT			**CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)**		**RESIDUAL RISK ASSESSMENT**		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Fall from scissor lift	4	3	High	NWHSC - Prevention of Falls in General Construction 2008	Timber or angle to be installed to the edge of concrete slabs to stop scissor lifts accidently being driven off edge of slab. Scissor lift operators must have a EWPAA yellow card or WP type ticket. Stabilizers and sole plates must be used for rough terrain scissors used on soft ground	3	1	Low
Inadequately installed roof perimeter handrail	4	3	High	NSW Identification Tool for Aluminium Mobile Scaffolds 2008	Installation certificate must be issued to HY prior to any worker accessing roof. Installation manual to be available on site so it can be confirmed the handrail has been installed as per the manufacturers specifications.	3	1	Low

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PROJECT:	**Newcastle High School Redevelopment**		1	2	3	4	5	Likelihood 1- Very unlikely 2- Remotely possible 3 - Possible 4 - Likely - 5 - Very Likely
JOB NO:	**SN111**	5	Medium	High	High	High	High	
		4	Medium	Medium	High	High	High	
ASSESSED BY:	Robert Petersen	3	Low	Medium	Medium	High	High	
		2	Low	Medium	Medium	Medium	High	
ASSESSMENT DATE:	14-Mar-24	1	Low	Low	Low	Medium	Medium	

	RISK ASSESSMENT			CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)		RESIDUAL RISK ASSESSMENT		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Potential Emergencies - preparation for and response to potential emergency events assessed high or medium risk to be defined in the Emergency Response Plan								
Arrested fall in a harness	4	3	High	HY Procedure for Emergency Response	All subcontractors using harnesses in boom lifts must have a rescue procedure as part of their SWMS. Generally rescue will be by using the ground controls at the base of the machine or by using a second boom lift to retrieve the suspended casualty.	3	1	Low
Bomb threat	3	1	Low	HY Procedure for Emergency Response	Procedure for bomb threats is part of the HY Emergency Response Plan	2	1	Low
Confined Space Rescue	3	2	Medium	HY Procedure for Emergency Response	Procedure for confined space rescue is part of the HY Emergency Response Plan	2	1	Low
Drowning	3	1	Low	HY Procedure for Emergency Response	Trenches are to be de-watered prior to any person working in around the area.	2	1	Low
Electric shock	3	2	Medium	HY Procedure for Defibrillators	Electric shock procedure detailed in the HY Emergency response plan	2	1	Low
Fire	3	2	Medium	AS 3745 Emergency control organisation and procedures for buildings, structures and workplaces AS/NZS 1221 Fire hose reels AS/NZS 1841 Portable fire extinguishers AS/NZS 1850 Portable fire extinguishers - Classification, rating and performance testing AS 1851 Maintenance of fire protection systems & equipment AS 2375 Guide to the selection, care & use of clothing for protection against heat & fire AS 2444 Portable fire extinguishers and blankets - Selection & location	Fire procedure detailed in the HY emergency response plan	2	1	Low
First Aid (inadequate resources)	3	2	Medium	HY Procedure for Emergency Response	First aid room to be set up with portable and fixed first type A first aid kits, stretcher, defibrillator, ice packs, sun cream, eye wash and examination couch as per Code of Practice: First Aid . (Refer to first aid assessment)	2	1	Low
Gas line contact or damage	2	1	Low	HY Procedure for Emergency Response	Jemena contact details are part of the HY Emergency response plan	1	1	Low
Major Fuel/Chemical Spill	3	2	Medium	HY Procedure for Emergency Response	Fuel/ Chemical spill is part of the HY emergency response plan	2	1	Low
Medical Emergency	3	2	Medium	HY Procedure for Emergency Response	Medical emergency is part of the HY emergency response plan	2	1	Low
Precast Panel Collapse	4	3	High	HY Procedure for Emergency Response	Precast panel collapse is part of the HY emergency response plan	3	1	Low
Structural failure/collapse	3	2	Medium	HY Procedure for Emergency Response	Structural collapse is part of the HY emergency response plan	2	1	Low

HANSENYUNCKEN

PROJECT HSE RISK ASSESSMENT

This Project HSE Risk Assessment is to be used as a guide when completing the monthly Project High Risk Identification assessment on HYWAY Site Management Dashboard in accordance with the Project HSE Risk Assessment procedure and should be conducted at the time of Construction programme statusing to assess hazards and risks for next month. Hazards with residual risk from the Design WHS Risk Assessment (if applicable) are also to be considered.

RELEVANT PROCEDURE:	Project HSE Risk Assessment		**Likelihood**	**Consequence 1- Insignificant, 2-Minor, 3- Moderate, 4-Major 5-Significant**				
PROJECT:	**Newcastle High School Redevelopment**			1	2	3	4	5
JOB NO:	**SN111**		5	**Medium**	**High**	**High**	**High**	**High**
			4	**Medium**	**Medium**	**High**	**High**	**High**
ASSESSED BY:	Robert Petersen		3	**Low**	**Medium**	**Medium**	**High**	**High**
			2	**Low**	**Medium**	**Medium**	**Medium**	**High**
ASSESSMENT DATE:	14-Mar-24		1	**Low**	**Low**	**Low**	**Medium**	**Medium**

Likelihood
1- Very unlikely
2- Remotely possible 3 -
Possible 4 -
Likely - 5 -
Very Likely

	RISK ASSESSMENT			**CONTROLS (to be established in the following order of priority 1st=High Level Risks; 2nd = Medium Level Risks; 3rd = Low Level Risks)**		**RESIDUAL RISK ASSESSMENT**		
HAZARD (Include additional project specific hazards as required)	**L**	**C**	**Class**	**Legislation, Standards & Codes of Practice**	**Enter Details of Specific Controls Required**	**L**	**C**	**Class**
Trench collapse	3	2	**Medium**	HY Procedure for Emergency Response	Trench collapse is part of the HY emergency response plan	2	1	**Low**

A.5 Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP)

traffic + transport

Construction Traffic & Pedestrian Management Sub-Plan

Newcastle High School Redevelopment

for

Hansen Yuncken

Document Control

Project No: 0406

Project: Newcastle High School Redevelopment CTPMSP

Client: Hansen Yuncken

File Reference: P0406r1v5 Newcastle High School Redevelopment CTPMSP

Revision History

Revision	Date	Details	Approved by
v1	14/02/2024	Draft 1	A. Reisch
v2	16/02/2024	Draft 2	A. Reisch
v3	18/03/2024	Draft 3	A. Reisch
v4	21/03/2024	Draft 4	A. Reisch
v5	21/03/2024	Final 1	A. Reisch

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1 Introduction

1.1 Overview

arc traffic + transport has been engaged by Hansen Yuncken to prepare a Construction Traffic & Pedestrian Management Sub-Plan (**CTPMSP**) to provide for the safe and efficient construction of the Newcastle High School (the **School**) Redevelopment (the **Project**) at 160/200 Parkway Ave, Hamilton South (the **Site**).

Full details of the Project are provided in State Significant Development 41814831 (the **SSD**) and subsequent **SSD Consent** prepared by the Department of Planning & Environment (**DPE**).

1.2 CTPMSP Author

The CTMPSP has been prepared by Anton Reisch, Director of arc traffic + transport, with additional input provided by Julius Boncato, Traffic Engineer at PDC Consultants. Curriculum Vitae's for each author are provided in Appendix A.

1.3 CTPMSP Tasks

In order to appropriately respond to the **Conditions** of Consent detailed in the SSD Consent (see also Section 1.6 below) the CTPMSP includes specific consideration of the following:

- The scope of work to be assessed as part of the CTPMSP in accordance with the SSD Consent, and Transport for NSW (**TfNSW**), Austroads and Australian Standards guidelines;
- The proposed construction schedule, including a breakdown of key stages of the construction period and the associated transport demands of each of those stages;
- General construction characteristics, including staff and truck numbers and construction hours;
- Access to and from the Site through all stages of construction, including the use of designated truck routes to minimise impacts on the local road network;
- Public and active transport opportunities for construction staff to minimise to as great an extent possible the use of private vehicle travel to/from the Site;
- Traffic generation and distribution through all stages of construction, and an assessment of the potential impact of construction traffic on the operation of the local road network;
- Staff and truck parking requirements and provisions;
- Mitigation measures by which to minimise to as great an extent as possible any potential impacts that the construction will have on existing road users, including motorists, pedestrians and cyclists; and

- Key strategies and protocols by which to maximise the safety and efficiency of construction operations across all stages of construction, focusing on the retention of safe and efficient vehicle, pedestrian and cyclist movements adjacent to the Site, and the ongoing monitoring of and – where required – revisions to the CTPMSP to respond to issues should they arise.

1.4 Reference Documents

1.4.1 Planning Documents

Key planning documents referenced in the preparation of the CTPMSP include:

- The SSD Consent;
- Newcastle Education Campus Traffic Impact Assessment 2023, Stantec (**SSD TIA**); and
- Newcastle Education Campus Environmental Impact Statement 2023, Gyde (**SSD EIS**).

1.4.2 Traffic and Transport Guidelines

The CTPMSP also references general traffic and transport guidelines, including:

- Australian Standard 1742 Manual of Uniform Traffic Control Devices Part 3: Traffic Control for Works on Roads (**AS 1742.3**);
- TfNSW Traffic Control at Work Sites Manual 2022 (**TCW Manual**); and
- Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments.

1.5 Consultation

Representatives of Council, TfNSW and School Infrastructure NSW (**SI NSW**) were involved in the preparation of the SSD TIA, forming (together with Stantec) a Project Working Group (**PWG**) that oversaw the preparation of the SSD TIA.

Subsequent to the SSD Consent and receipt of Conditions, arc traffic + transport has also engaged with Council and TfNSW during the preparation of the CTPMSP to determine the scope of work provided, as well as any additional assessment requirements potentially not specified in the Conditions. To better facilitate this consultation, a copy of the Draft CTPMSP (Version 2, attached as Appendix G) was provided for specific comment.

At the time of submitting this CTPMSP, a written response had been received from Council but not from TfNSW.

All correspondence with Council and TfNSW is provided in Appendix B.

1.6 CTPMSP Conditions of Consent

In accordance with the SSD Consent, the CTPMSP is provided as a *Sub-Plan* to the broader Construction Environmental Management Plan (**CEMP**) being prepared by Hansen Yuncken, and provides an assessment of the relevant access, traffic and parking characteristics of the construction of the Project in accordance with the SSD Consent.

The CTPMSP specifically provides a response to Condition 15b of the SSD Consent, and then to other Conditions of relevance to the construction period; Table 1 provides a summary response to each of these individual Conditions, and a reference to where each is addressed in more detail.

A summary response to each of the comments raised during the consultation period, and a reference to where each is addressed in more detail, is provided in Table 2. arc traffic + transport wishes to acknowledge the assistance of both Council and TfNSW representatives in determining the scope of the CTPMSP and the identification of local issues requiring specific attention.

Table 1: Summary Response to SSD Consent Conditions

SSD Condition B15	Summary Response	TA Reference
The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following:		
(a) be prepared by a suitably qualified and experienced person(s);	This CTPMSP has been prepared by Anton Reisch, Director of arc traffic + transport; and Mr Ben Midgeley, Principal Traffic Engineer at PDC Consultants. Anton has worked as a traffic and transport consultant for mor than 30 years and has significant experience in the preparation of CTPMSP, most recent for the Jindabyne Education Precinct. Julius has worked as a traffic engineer for more than 5 years, and is fully accredited to *Prepare a Work Zone Traffic Management Plan* in accordance with the TCW Manual and AS 1742.3. CVs for both Anton and Julius are provided in Appendix A.	Appendix A
(b) be prepared in consultation with Council and TfNSW;	arc traffic + transport has consulted with Council and TfNSW during the preparation of the CTPMSP, including providing both with a copy of a Draft CTPMSP for review prior to the finalisation of the CTPMSP.	Section 1.5 Appendix B
(c) include a Driver Code of Conduct which must be prepared and communicated by the Applicant to heavy vehicle drivers and aim to:	A detailed Driver Code of Conduct has been prepared, and will apply to truck drivers and all those using branded construction vehicles.	Section 4.4.6 Appendix D
i. minimise the impacts of earthworks and construction on the local and regional road network; *ii. ensure truck drivers use specified routes;* *iii. minimise road traffic noise; and* *iv. ensure truck drivers use specified routes;*	The Driver Code of Conduct will require that all trucks use designated routes to ensure that they use higher order roads rather than local roads. As such, truck movements in Smith Street will be limited to the southern section of the road between the Site's construction driveway and Parkway Avenue; while access will be available along the full length of National Park Street, but not via any local streets west of National Park Street. Access to the sub-regional road network would then be provided via Stewart Street north (to King Street) and south (to Pacific Highway); or directly to King Street (via National Park Street)	Section 4.4.6 Appendix D

Table 1: Summary Response to SSD Consent Conditions (continued)

SSD Condition B15	Summary Response	TA Reference
(d) detail:		
i. measures to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;	Along with the obligations on all drivers detailed in the Driver Code of Conduct, trip generation will be minimised further to the use of public transport by staff, and minimising truck trips during school (and commuter peak periods) to the extent practicable. Scheduling of truck trips can be specific achieved during most construction periods given the set delivery of pre-fabricated modules/buildings off-site.	Section 4.2
ii. measures to ensure the safety of vehicles and pedestrians accessing adjoining properties where shared vehicle and pedestrian access occurs;	Appropriate signage and additional traffic control measures will be in place at both construction driveways, the objective of which is to minimise the potential for vehicle/pedestrian conflicts in Smith Street and National Park Street.	Section 4.2 Section 4.3
iii. heavy vehicle routes, access and parking arrangements;	The use of dedicated truck routes will be strictly enforced, and all truck loading and unloading will take place exclusively within the Site. All access to the Site will be via the designated construction driveways only, and no trucks will be permitted to park or wait in local roads.	Section 3.4.3
iv. *the swept path of the longest construction vehicle entering and exiting the site in association with the new work, as well as manoeuvrability through the site, in accordance with the latest version of AS 2890.2; and*	Swept paths of a 12.5m Heavy Rigid Vehicle (**HRV**) accessing and turning within the Site are provided in TIA 2023 and reproduced in Appendix F. Additional swept paths have been prepared for an Articulated Vehicle (**AV**) accessing and turning within the Site, as well as manoeuvring through key local intersections; these swept paths are also provided in Appendix F.	Appendix F
v. *arrangements to ensure that construction vehicles enter and leave the site in a forward direction unless in specific exceptional circumstances under the supervision of accredited traffic controller(s)*	It is intended that all trucks enter and depart the Site in a forward direction; however, should any trucks be required to enter or depart the Site in reverse, appropriate traffic control measures will be in place to maximise the safety and efficiency of any such movements.	Section 3.2

Table 1: Summary Response to SSD Consent Conditions (continued)

SSD Condition Additional Conditions	Summary Response	TA Reference
Condition B24: Construction Parking *Prior to the commencement of any construction, the Applicant must submit a Construction Worker Transportation Strategy to the Certifier. The Strategy must detail the parking facilities to be used by construction workers as identified within the Traffic Impact Assessment prepared by Stantec dated 5 December 2023, or other travel arrangements for construction that would minimise demand for parking in nearby public and residential streets or public parking facilities. A copy of the strategy must be published on the Applicant's website in accordance with condition A23. This condition cannot be staged.*	A Construction Worker Transportation Strategy (**CWTS**) has been prepared and provided as Appendix E of the CTPMSP. The CWTS outlines the strategies by which the use of public transport by construction workers will be highly prioritised so as to minimise the use of on-street parking in the vicinity of the Site.	Appendix E
B29: Operational Access, Car Parking and Service Vehicle Arrangements *Prior to the commencement of construction of access facilities, evidence of compliance of the design of access arrangements with the following requirements must be submitted to the Certifier:*		
a) *the existing 40 on-site car parking spaces being available for use during operation of the development; and*	A minimum of 40 on-site parking spaces will be retained throughout the construction period to provide on-site parking capacity for School staff.	Section 2.5.1
b) the swept path of the largest service vehicle entering and exiting the site in association with the new work, as well as manoeuvrability through the site, must be in accordance with the latest version of AS 2890.2.	Swept paths of a 12.5m Heavy Rigid Vehicle (**HRV**) accessing and turning within the Site are provided in TIA 2023 and reproduced in Appendix F. Additional swept paths have been prepared for an Articulated Vehicle (**AV**) accessing and turning within the Site, as well as manoeuvring through key local intersections; these swept paths are also provided in Appendix F.	Appendix F

Table 1: Summary Response to SSD Consent Conditions (continued)

SSD Condition Additional Conditions	Summary Response	TA Reference
C10: Construction Traffic *All construction vehicles (excluding site personnel vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site or an approved on-street work zone before stopping.*	The majority of loading and handling will be undertaken on-site, as will the turning movements of trucks. Notwithstanding, a Work Zone in National Park Street adjacent to the primary (internal) works area has been recently approved by Council, and all activities within the Work Zone and across the adjacent footpath will be appropriately monitored to maintain maximum safety for pedestrians. Should any additional Work Zones be required, an application for such would be prepared and submitted to Council for approval prior to any use of that Work Zone. .	Section 4.1.2 Section 4.2.1
C14: Construction Noise Limits *The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C4.*	All trucks will only be permitted to access the Site during the designated construction hours as detailed in Condition C4 – C8 inclusive of the SSD Consent. Additionally, truck will not be permitted to enter or depart the Site during standard School Zone periods, being 8:00am – 9:30am and 2:30pm – 4:00pm on school days to further enhance safety.	Section 3.1.3 Section 3.4.1
D13: Road Damage *Prior to the commencement of operation of the final stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the cost of repairing any damage caused to Council or other Public Authority's assets in the vicinity of the Subject Site as a result of construction works associated with the approved development must be met in full by the Applicant.*	Road dilapidation surveys will be undertaken prior to the commencement of construction in the key sections of Parkway Avenue, Smith Street and National Park Street providing trucks access to/from the Site. Road dilapidation surveys would then be undertaken during the construction period to ensure that any damage to the road is rectified as soon as possible further to consultation with Council. Ultimately, the objective of the road dilapidation protocols will be to ensure that all key sections of road are in the same or better condition than they were prior to construction activities commencing.	Section 4.5

Table 2: Summary Response to Comments Raised during Consultation

City of Newcastle Council Comments	Summary Response	TA Reference
1. Driveway 2 is not existing. It is only a personnel gate connecting to footpath. Additional consideration must be given to the necessary applications/permits needed to facilitate this crossover - however temporary/permanent it will be: *a. A Work Zone permit can be used to clear parking from the vicinity of any temporary layback.* *b. Unless covered by a separate approval, a Type 1 S138 application needs to be approved by CN to add a driveway or augment a driveway in the road reserve for this project (it may not be necessary for the driveway works you intend, but this cannot be determined without you first seeking an application of this nature and providing plans to be considered).*	Hansen Yuncken recently submitted a Section 138 application to Council for the provision of the new access driveway (**Driveway 2**) in National Park Street, and it is anticipated that an approval of the application will be provided in the short term, and moreover will be required prior to the Driveway 2 construction commencing. As discussed, a Work Zone permit has been approved by Council for a kerbside section of National Park Street adjacent to Driveway 2.	Section 3.2

Table 2: Summary Response to Comments Raised during Consultation (continued)

City of Newcastle Council Comments	Summary Response	TA Reference
2. The claim that HRV swept-paths succeed in accounting for AV swept-paths is noted. However, swept-path assessments only show HRV/MRV turnaround manoeuvres, not AV turnaround manoeuvres. Please either: *a. Confirm internal roads exist which link, or will link, driveway 1 with driveway 2 that removes the need for an AV to turnaround in the off-street area; or* *b. Provide swept-path analyses showing an AV can turnaround off-street, or an explanation of the methodology to be used to get them safely back onto the road.*	Additional swept paths showing the movements of AVs to both Driveway 1 and Driveway 2, and within the Site, have been prepared as requested by Council. An internal link between the driveways is not proposed, and as such the swept path analysis shows AVs entering from both driveways, turning within the Site, and then departing each driveway in a forward direction. Importantly, this swept path analysis identified constraints for AVS travelling to/from both driveways, and specifically their inability to negotiate turning movements at the intersections of Parkway Avenue & Smith Street and Parkway Avenue & National Park Street without crossing the centre line in each road. AV access to/from Driveway 2 will still be available via National Park Street and its intersection with King Street. While it is anticipated that the majority of vehicles using Driveway 1 would be no larger than a HRV, should there be any requirement for a larger vehicle to access Driveway 1, a Traffic Guidance Scheme (**TGS**) will need to be prepared so that the movements of such a vehicle can be undertaken in the safest and most efficient manner practicable, most likely under the supervision of authorised traffic controllers.	Section 3.4 Appendix F

Table 2: Summary Response to Comments Raised during Consultation (continued)

City of Newcastle Council Comments	Summary Response	TA Reference
3. Noting that discussions elsewhere have likely occurred on this topic and may speak to the following, I would suggest extending the dilapidation survey to include all of Parkway Avenue between Smith Street and Stewart Avenue if at all possible.	The road dilapidation survey protocols have been extended to include: • Parkway Avenue between Smith Street and Stewart Street; • Smith Street between Driveway 1 and Parkway Avenue; and • National Park Street between King Street and Parkway Avenue.	Section 4.5
Further comments can be provided as needed on yet to be completed components of this plan if a 'completed' draft is provided to us. *I have no comments regarding the draft Construction Worker Transportation Strategy Newcastle Education Campus document.*		Noted

2 The SSD Approval

2.1 Site Location

The Site is located at 160/200 Parkway Ave, Hamilton South, and is bordered by Parkway Avenue, National Park Street and Smith Street. The Site is shown in its local context and broader context within Newcastle City in Appendix A and Figure 9 of SSD TIA respectively, which are reproduced below.

Figure 1: Site Location

Source: SSD TIA

Figure 2: Site Location within Newcastle

Source: SSD TIA

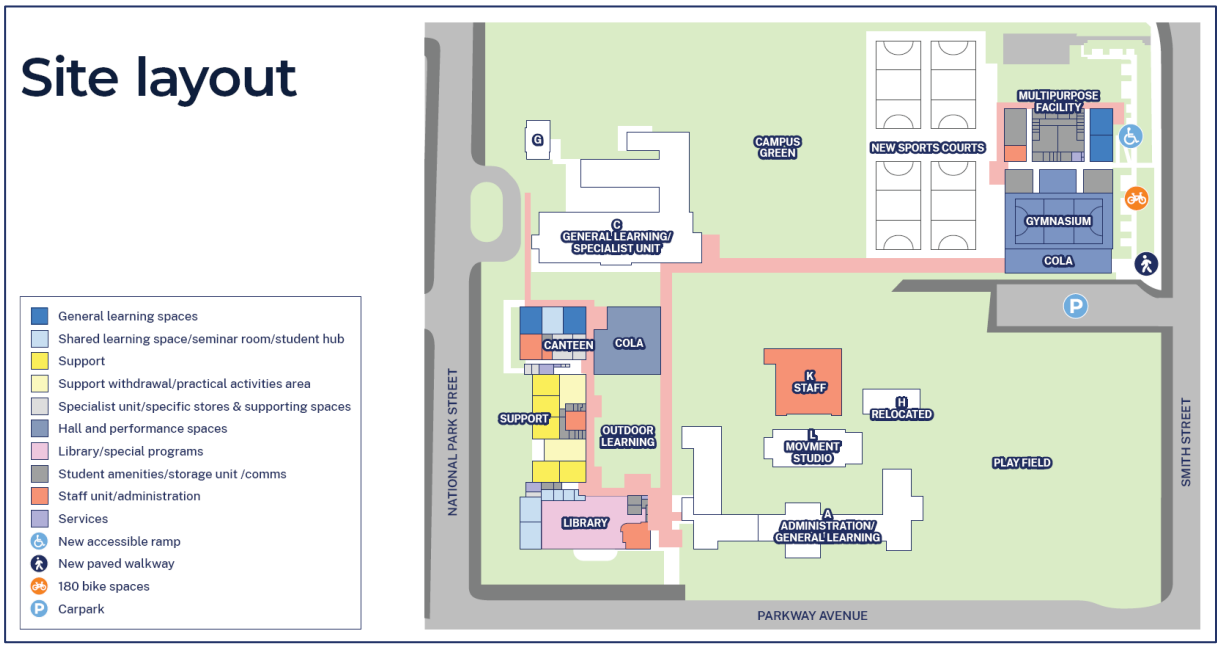
2.2 The SSD Consent

The SSD Consent provides for the redevelopment of the Site to include:

- Demolition of eight (8) existing buildings;
- Construction of a new three (3) storey learning hub located on the southwestern corner of the campus;
- Construction of a new multi-purpose facility located in the north-eastern corner of the campus;
- Internal refurbishment works within the existing administration building on Parkway Avenue to form a new student;
- A new student entry from Parkway Avenue; and
- Relocation of Block H approximately 50m South.

The Newcastle High School Redevelopment Master Plan is shown in Figure 3.

Figure 3: Newcastle High School Redevelopment Master Plan



Source: EJE Architecture

2.3 Access

2.3.1 Vehicle Access

With reference to Figure 3, access to a new drop-off/pick-up (**DOPU**) facility for support students will be provided from National Park Street, while access to the staff car park will continue to be provided from Smith Street.

2.3.2 Active Transport Access

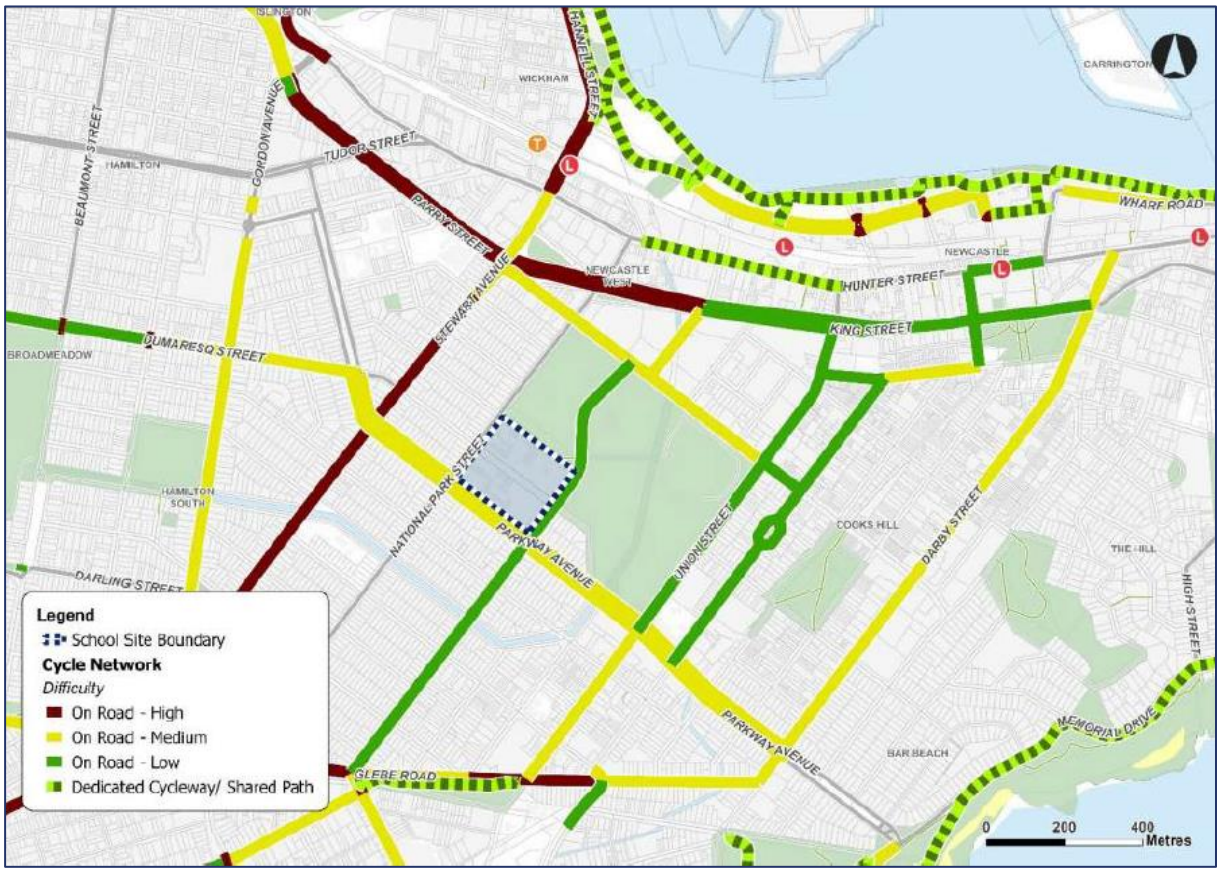
The Site is provided with excellent active transport connectivity, including numerous gates to all frontage roads. These roads in turn all provide appropriate footpath infrastructure (generally on both sides of the road), and while there are no dedicated cycleways (off-road) in the immediate vicinity of the Site, on-road cycling conditions are relatively safe.

An overview of the active transport infrastructure at and in the vicinity of the Site is provided in Figure 4 (footpaths) and Figure 5 (cycling) of the SSD TIA, which are reproduced below.

Figure 4: Campus and Local Pedestrian Infrastructure

Source: SSD TIA

Figure 5: Cycle Routes



Source: SSD TIA

2.4 Traffic

In consultation with the PWG, the anticipated trip generation (all modes) of existing School students and staff were determined in the SSD TIA, and then the future trip generation (all modes) determined further to the establishment of travel mode targets for the redeveloped School (identified in Section 5 of the SSD TIA), including strategies detailed in the Draft Green Travel Plan (**Draft GTP** - Section 9 of the SSD TIA).

Further to the implementation of these strategies – and as agreed with the PWG – the private vehicle trip generation of the School is not anticipated to increase (further to the SSD Consent), even though there is an increase in student (and staff) numbers, as a result of more students (and staff) moving to sustainable travel modes rather than using private vehicles to travel to/from the Site.

2.5 Parking

2.5.1 School Staff Parking

40 school staff parking spaces are provided in the on-site car park accessed via Smith Street; these 40 parking spaces will be retained further to the Project, and importantly will be available to school staff through the duration of the construction works.

No on-site parking is provided for students, and the use of on-street parking by students is discouraged, noting that demand for private vehicle travel will be minimised further to the implementation of the [Final] GTP.

2.5.2 Visitor Parking

Time limited and unrestricted parking is provided in all frontage roads for use by visitors.

2.6 Drop-Off & Pick-Up Facilities

On-street DOPU facilities are provided in Parkway Avenue, and will be retained further to the proposed works; importantly, this DOPU facility would not be impacted through the construction period.

As noted, a new internal DOPU facility for support students will be provided on-site via separate entry and departure driveways in National Park Street.

2.7 Bus Bays

Bus operations in Parkway Avenue will be largely unchanged, but further to the identification of some capacity issues with the existing bus bays in Parkway Avenue, the SSD TIA recommended further consideration of the following:

- An extension of the Parkway Avenue bus zone to provide for 1 additional bus set down bay; and
- The installation of No Stopping signage between the bus zone and DOPU facility to discourage illegal stopping.

While the SSD TIA considered that the measures above would have no impact on existing bus or DOPU operations, it is acknowledged that the implementation of such changes will be the responsibility of Council, who we understand have committed to a review of these issues.

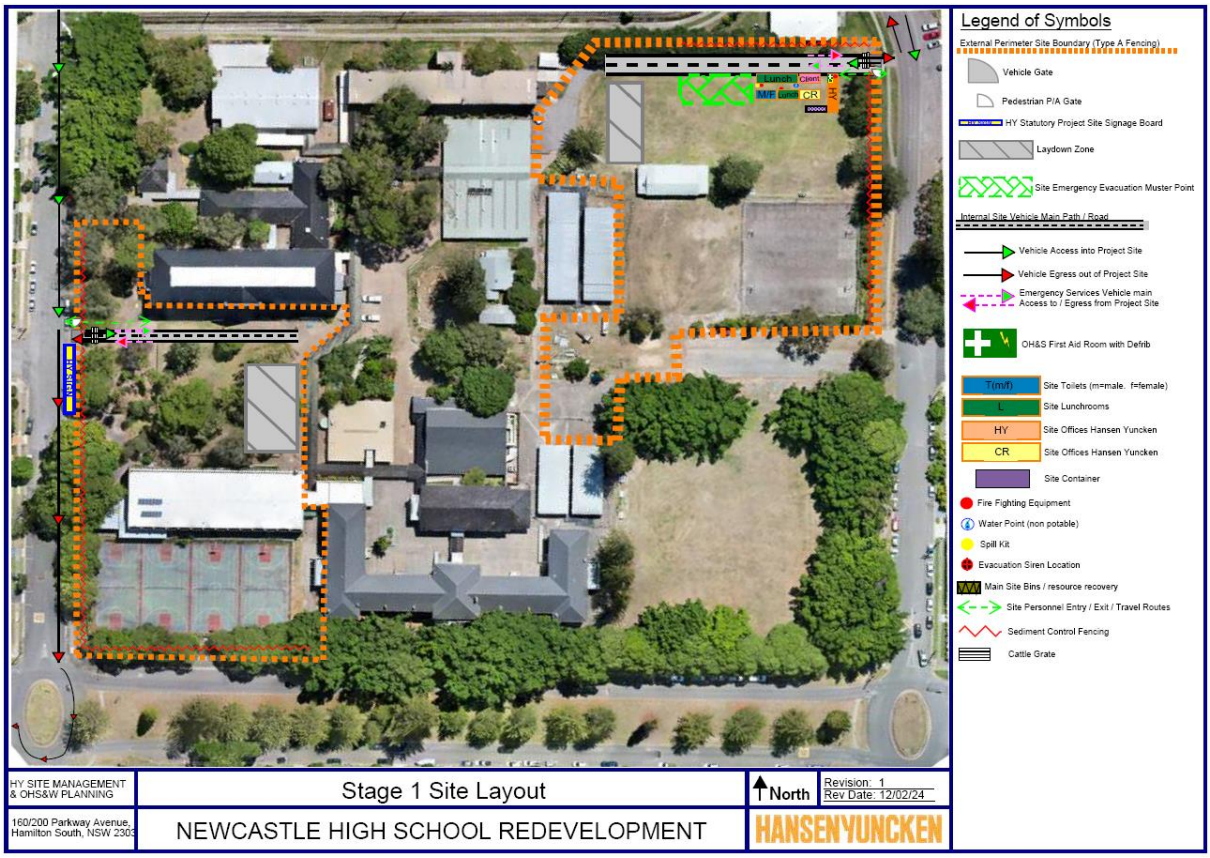
3 Construction Characteristics

3.1 General Construction Characteristics

3.1.1 General Works Plan

A plan of the general work areas across the Site, as well as access locations and on-site construction staff facilities has been prepared by Hansen Yuncken, and is reproduced below.

Figure 6: Newcastle High School Redevelopment General Works Plan



Source: Hansen Yuncken

3.1.2 Construction Schedule and Staff

Hansen Yuncken has provided a summary of the general characteristics of the construction schedule, which is provided below in Table 3, noting that construction is anticipated to commence in mid-late March 2024 and be completed by December 2025.

Table 3: Construction Schedule Characteristics

Construction Stage	Construction Tasks	Scheduled Timing	Average Staff/day	Maximum Staff/day	Average Trucks/Day	Maximum Trucks/Day
1	Building H relocation Service upgrades Demolition	13 weeks	50	70	5	10
2 & 3 (concurrent)	Learning Hub Support student DOPU Multi-Purpose facility Landscaping and ancillary works	47 weeks	80	140	10	20
4	Demolition Building A and K refurbishment Landscaping and ancillary works	14 weeks	5	10	5	10
5	Demolition Sports Courts Campus Green Landscaping and ancillary works	16 weeks	5	10	1	2

3.1.3 Construction Hours

In accordance with Condition C4 of the SSD Consent, construction hours will be as follows:

- 7:00am to 6:00pm Monday to Friday;
- 8:00am to 1:00pm on Saturdays; and
- No construction works permitted on Sundays or public holidays.

It is noted that while the start and finish times are provided for construction in general, additional restrictions will be in place for truck movements during school arrival and departure peaks. In this regard, and as stipulated by SI NSW, truck movements to/from the Site will not be permitted during standard School Zone periods between 8:00 - 9:30am and 2.30 - 4:00pm on school days unless agreed with the School Principal (see also Section 3.4.1).

Notwithstanding Condition C4, Condition C5 of the SSD Consent states the following:

> *provided noise levels do not exceed the existing background noise level plus 5dB, works may also be undertaken during the following hours:*
>
> *(a) between 6pm and 7pm, Mondays to Fridays inclusive; and*
> *(b) between 1pm and 4pm, Saturdays.*

As is also relatively standard for major construction projects, Condition C6 and Condition C7 of the SSD Consent also provide for construction activities outside of the hours detailed in Conditions C4 and C5 of the SSD Consent under some circumstances, stating:

> *C6. Construction activities may be undertaken outside of the hours in condition C4 (and C5) if required:*
>
> *(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or*
> *(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or*
> *(c) where the works are inaudible at the nearest sensitive receivers; or*
> *(d) for the delivery, set-up and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or*
> *(e) where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.*
>
> *C7. Notification of such construction activities as referenced in condition C6 must be given to affected residents before undertaking the activities or as soon as is practical afterwards*.

Finally, Condition C8 of the SSD Consent restricted hours for construction activities that would generally result in more significant noise impacts, such as rock breaking, rock hammering, sheet piling, pile driving and other similar activities. These works can only be undertaken during the following periods:

- 9:00am to 12:00pm Monday to Friday;
- 2:00pm to 5:00pm Monday to Friday; and
- 9:00am to 12:00pm on Saturdays.

3.1.4 Out of Hours Work Permits

While not anticipated at this time, where it is necessary for any significant construction works to occur outside of the conditioned work hours, an application for an Outside of Hours Work Permit (**OHW Permit**) will be submitted to Council, and adjacent residents will also be notified of the proposed works. Approval from the School Principal will also be required for any such works.

Any out of hours works would only commence further to an approval of the OHW Permit.

3.2 Site Access

For the duration of the construction period, access to the Site for construction vehicles will be provided via the existing driveway in Smith Street (**Driveway 1**) and a new driveway in National Park Street (**Driveway 2**).

With regard to Driveway 2, Hansen Yuncken has submitted a Section 138 application to Council for the construction and operation of Driveway 2; we understand that Council is currently considering this application but that there is general agreement between the parties that this is an acceptable driveway location. As discussed, a **Work Zone** application for kerbside space in National Park Street at Driveway 2 has already been approved by Council.

These construction driveways and the approved Work Zone are shown in Figure 7, noting that no general School (staff or student) access would be available via these construction driveways for the duration of the construction period.

Figure 7: Construction Vehicle Access

Source: Nearmap

3.3 Public & Active Transport Access

3.3.1 Overview

Further to a determination that parking for construction staff cannot be provided on-site, and then consideration of the need to reduce staff parking in local streets (given the residential and existing School parking demand) it is proposed that the majority of construction staff be directed to use alternative travel modes to travel to/from the Site.

The means by which this can be achieved are detailed further in the Construction Worker Transportation Strategy (**CWTS**) provided in Appendix A, but rely heavily on the use of public and active transport, as discussed further in sections below.

3.3.2 Newcastle Interchange

Newcastle Interchange (**NI**) is located approximately 1.0km north of the Site, or a 10 – 15 minute walk depending on the route taken. NI provides an interchange of rail, light rail and bus services, which are discussed further below.

3.3.3 Rail

NI is serviced by Central Coast & Newcastle Line and Hunter Line trains, with up to 2 services per hour and 4 services per hour on each line respectively, including services during the construction arrival and departure peaks.

3.3.4 Light Rail Services

The Newcastle light rail services runs between NI and Newcastle Beach, with services every 15 minutes in the AM construction arrival peak, and every 7.5 minutes in the PM construction departure peak.

3.3.5 Ferry Services

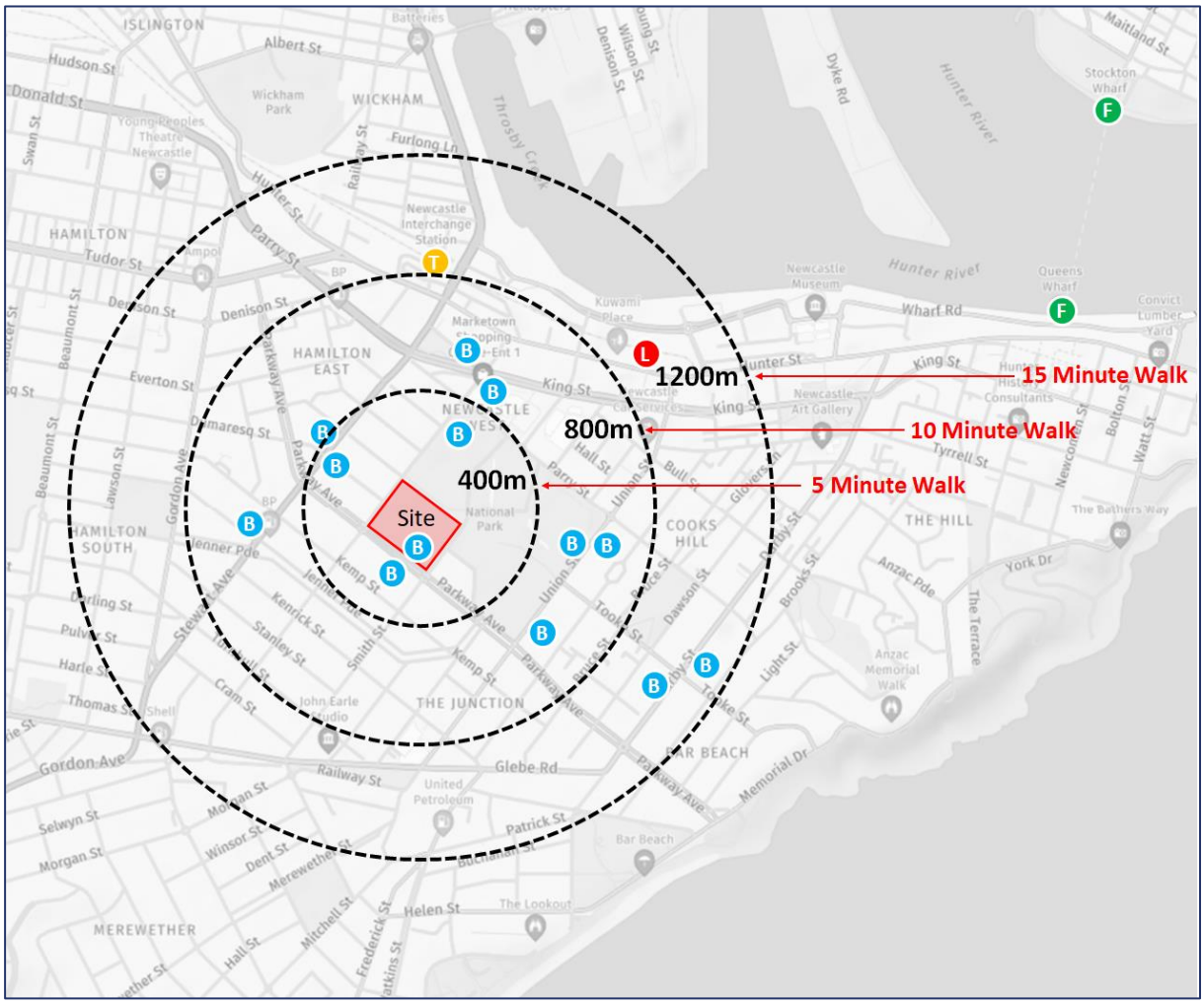
Ferry services operate between Stockton Wharf and Newcastle Wharf every 20 – 30 minutes during the construction arrival and departure peaks; a large commuter car park is provided adjacent to Stockton Wharf.

3.3.6 Bus Services

The Site is very well serviced by public buses, with bus stops within appropriate walking distance in Parkway Avenue and National Park Street, as well as King Street to the north, Union Street and Darby Street to the east, and Stewart Street to the west.

The location of these bus stops (and other transport hubs) and their proximity to the Site is shown in Figure 8, while individual bus routes and service frequencies (during the construction arrival and departure peaks, i.e. prior to and following standard commuter peaks) are shown in Table 4.

Figure 8: Bus Stop Locations



Source: Nearmap

Table 4: Bus Services

Route	Origin-Destination	Bus Stop Location	Construction Peak Frequency
10X	NI to Charlestown	King St	20 - 30 min
12	Maryland - Merewether via NI	Union Street	15 - 20 min
14	Swansea Heads - Newcastle	Darby Street	30 min
21	Broadmeadow - Newcastle	Parkway Ave	40 - 50 min
22	Charlestown - Newcastle	King Street/Stewart St	30 min
23	Wallsend - Newcastle vi NI	King Street	30 min
26	Newcastle West to Wallsend via NI	King Street	30 - 40 min
28	Mount Hutton to Newcastle West vi NI	King Street	30 - 60 min
47	Jesmond to Market Town via NI	National Park St	60 min
138	NI - Lemon Tree Passage	Parkway Ave	1 service in each peak

Source: TfNSW

3.3.7 Active Transport

While it is unlikely that many construction staff will reside in the immediate vicinity of the Site, as discussed in Section 2.3.2 the local active transport environmental provides pedestrians paths in all key roads providing access between the Site and NI, light rail and bus stops.

3.3.8 Public & Active Transport Summary

Having made a determination that there will be no construction staff parking provided on-site, and moreover a determination that the use of private vehicles by construction staff will be specifically discouraged, it is important to recognise the breadth of public transport services available for travel to/from the Site, including viable services from across the LGA and adjacent LGAs. Paired with an excellent active transport network, it is as such anticipated that private vehicle trips by construction staff can be significantly reduced (see also Section 3.6).

3.4 Construction Trucks

3.4.1 Truck Movement Hours

As discussed in Section 3.1.3, truck movements will be restricted to the same start and finish times as general construction works. However, in accordance with the request of SI NSW, and so as to maximise the safety of students and staff throughout the construction period, no truck access will be permitted to the Site (either construction driveway) during the following periods on school days:

- 8:00am – 9:30am; and
- 2:30pm – 4:00pm.

If truck access to the Site is required at any time during these School Zone periods, the Principal Contractor will provide as much notice as possible to the School Principal, and all truck movements to/from the construction driveways would occur under the direction of properly accredited persons to be engaged by the Principal Contractor.

Any more general out of hours truck movements (i.e. before 7:00am or after 6:00pm) would be subject to the same OHW Permit application and notification process as described in Section 3.1.4.

3.4.2 Truck Types

The type of trucks required during the construction period will include Medium Rigid Vehicles (**MRV**s) and Heavy Rigid Vehicles (**HRV**s); a small number of Articulated Vehicles (**AV**s) may also be required on occasion. Importantly, all of these vehicles would be classified as General Access Vehicles (**GAV**s) in accordance with TfNSW guidelines, which are able to use the entire public road network.

Notwithstanding, there is the potential to generate a small number of Restricted Access Vehicles (**RAV**s) and/or Oversize Overmass vehicle (**OSOM vehicles**), which may include floats for plant, large pieces of equipment or mobile cranes. Prior to any of these vehicle types travelling to from the Site, specific permission with be required, including:

- Depending on their dimensions, RAVs that exceed the dimensions for GAVs may be eligible to operate under a **RAV Notice**; RAV Notices allow for greater dimension/mass limits than GAVs further to compliance with additional conditions (such as route restrictions).
- For the use of any OSOM vehicles, an Oversize Overmass Permit (**OSOM Permit**) will be required. OSOM Permits are generally issued with conditional restrictions that limit the time and days that these vehicles are allowed to access the Site, and the route they are allow to take.

Again, no RAV or OSOM vehicles would be permitted to travel to/from the Site prior to the appropriate approval of either a RAV Notice or OSOM Permit.

3.4.3 Designated Truck Routes

A Vehicle Movement Plan (**VMP**) has been prepared in accordance with Section 5.2.2 of the TCW Manual. The VMP identifies the designated truck routes to be used for travel to/from the Site; to the extent possible, these routes use higher order roads rather than local residential streets.

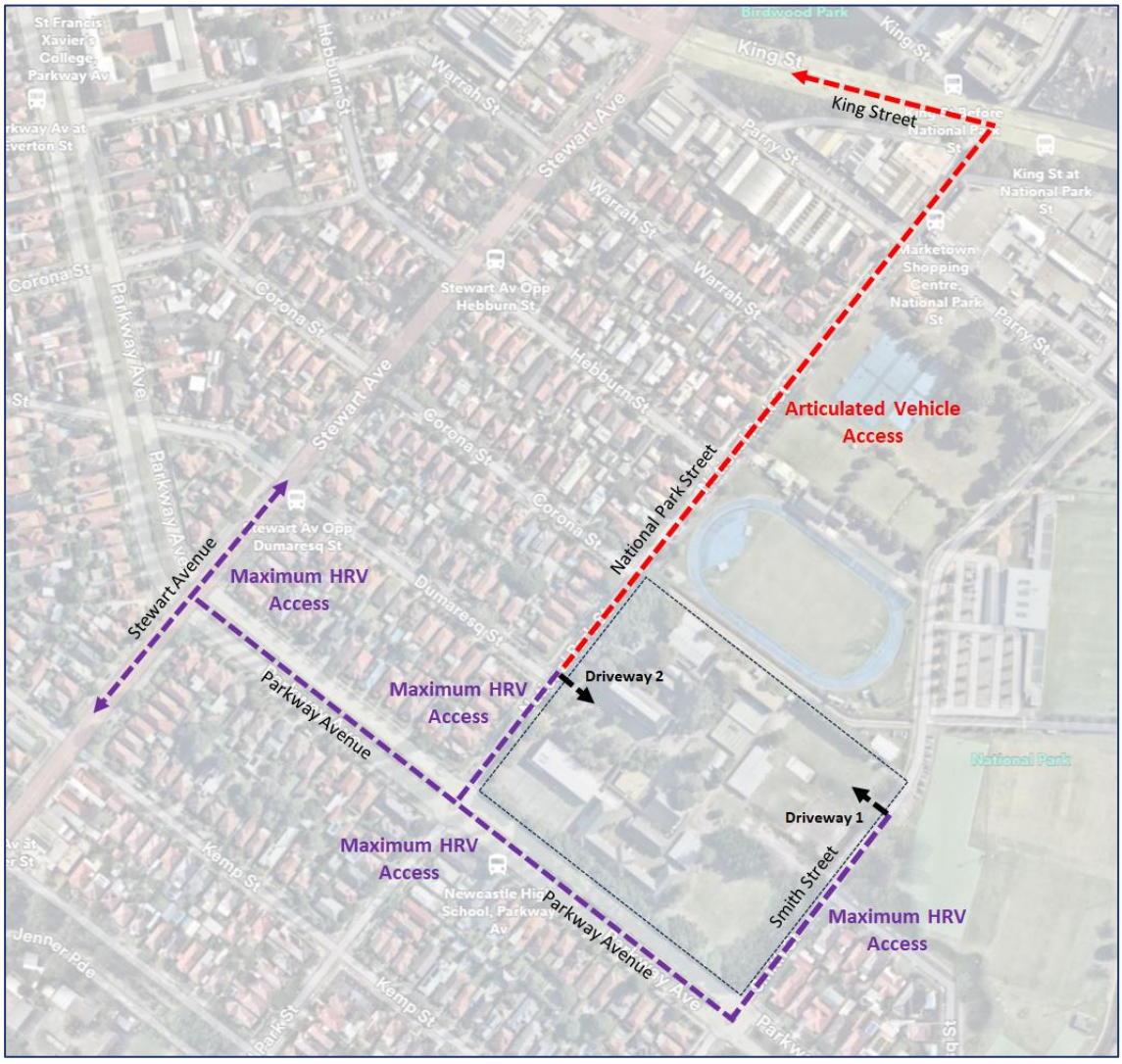
Importantly, while a number of routes will be available for all vehicles up to and including a HRV, the assessment of swept paths for trucks travelling to and from the Site (Section 3.4.4 below) indicated that AVs were unable to appropriate navigate the roundabout intersections of Parkway Avenue & Smith Street, and Parkway Avenue & National Park Street, primarily due to the elliptical shape of the roundabouts.

As such, general (without special permit approval) AV access to the Site would be restricted to National Park Street between King Street and Driveway 2. This would have essentially no impact on the movement of AVs to/from Driveway 2, as the King Street route – like Stewart Street – is a higher order sub-regional road as well as being approved for RAVs. However, this does impact the movement of AVs to/from Driveway 1, as the alternative route north to the intersection of Smith Street & Parry Street is similarly unsuitable for AV movements.

As such, any AV (or larger vehicle) would only be able to access Driveway 1 further to the preparation of a TGS detailing how these movements could be undertaken safely and efficiently. With reference to the swept path figures in Section 3.4.4, it is anticipated that this could occur and the supervision of traffic controllers (temporarily blocking vehicles travelling in the opposing direction in Smith Street) but again any such movements would occur only further to the approval of a TGS.

Further to the above, the designated travel routes for all trucks are shown in Figure 9.

Figure 9: Vehicle Movement Plan - Designated Truck Routes



Source: Nearmap

3.4.4 Swept Paths

As discussed above, swept path figures are provided in the SSD TIA which show the movement of HRVs through local intersections and to/from Driveway 1 and Driveway 2; they also shown the movement of HRVs within the Site, i.e. being able to turn so as to enter and depart the Site in a forward direction.

Conversely, further to a request from Council for swept paths showing an AV entering, turning within and then departing the Site, our analysis determined that there were constraints for AV movements at the intersections of Parkway Avenue & National Park Street and Parkway Avenue & Smith Street, which is why the designated routes shown in Figure 9 differentiate routes for truck up to and including a HRV, and then for AVs.

Importantly though, all HRVs and AVs are then able to enter, turn within and depart both Driveway 1 and Driveway 2 in an appropriate manner. These swept path figures are provided in Appendix F.

3.5 Construction Traffic

3.5.1 Staff Trip Generation

With reference to Table 3, it is estimated that a maximum of up to 140 staff would be on-site at any one time (during the peak Stage 2/3 construction period); this would include general construction staff, Project Managers and tradespeople. It is acknowledged that this is higher number of construction staff than indicated in the SSD TIA.

With reference to Section 3.3 above, and the CWTS provided in Appendix E, construction staff will be instructed to use public or active transport to travel to/from the Site, not private vehicles. Given the Site's proximity to the excellent rail, light rail and bus services within walking distance of the Site, these services will provide a more than viable travel option for construction staff throughout the construction period.

Notwithstanding, and with reference to Section 3.6 below, it is reasonable to conclude that there will be some parking demand generated by construction staff, most likely in the No. 2 Oval car park in Smith Street, and on-street parking along Smith Street north of the Site. The majority of these spaces are paid spaces with an 8 hour parking limit (again something that would discourage most construction staff for a work day longer than 8 hours) but would generally be available during the day given that primary demand for this parking would be on weekends when local recreational facilities were being used.

It is noted that construction staff numbers on Saturdays are anticipated to be significantly lower than on weekdays (throughout the construction period).

Based on the construction hours (i.e. with peaks prior to and after commuter peak periods); the minimisation of construction staff using private vehicles; and what are almost always high vehicle occupancies for construction vehicles, it is estimated that construction staff would generate no more than 20 vehicle trips per hour (**vph**) during the commuter peak periods.

3.5.2 Truck Trip Generation

With reference to Table 3, an average of 10 trucks per day (20 truck trips per day) would be required during the majority of construction stages, then peaking at up to 20 trucks per day (40 truck trips per day) for a short period for the delivery of modular buildings to the Site (estimated to be only 2 – 3 weeks during Stage 3).

Based on a spread of these movements over the day, it is estimated that no more than 6 truck trips could be generated in a single hour even during the peak modular delivery period. Importantly, it is again unlikely that this peak number of hourly truck movements would occur during the commuter peak periods as a factor of cost efficiency (i.e. faster trips outside the commuter peak periods) and the general start-up/shut-down periods at the start and end of the workday where trucks are unlikely to be utilised.

3.5.3 Trip Distribution

As discussed in Section 3.4.3, all truck movements will be limited to the routes shown in the VMP, while staff vehicle trips would generally have a similar distribution, but also generating some trips to the east and south-east for construction staff living in Newcastle.

3.5.4 Construction Traffic Impacts

With reference to sections above, there is little if any potential for the additional trips generated during the construction period to have any significant impact on the road network further to consideration of:

- The low percentage of construction staff using private vehicles, and even then, the high vehicle occupancies of such trips;
- The generation of most construction trips outside of commuter peak periods;
- The distribution of trips to a number of different routes; and
- The relatively short-term nature of the construction period.

3.6 Parking

3.6.1 Staff Parking Provision

As discussed in Section 2.5.1, no parking will be provided on-site for construction staff, though measures will be in place to allow staff to drop-off/pick-up tools and equipment; this would only occur within the Site.

Given this limitation on the provision of internal parking, and as discussed in Section 3.5.1, it is the intention of the CWTS that the use of private vehicles by construction staff be limited to as great an extent as possible, and in turn that parking demand (for what would be off-site parking spaces) would similarly be minimised.

While it is acknowledged that that some construction staff parking will exist, this will strictly be in non-residential roads and off-street car parks, including the No. 2 Oval car park and on-street parking in Smith Street north of the Site. These restrictions will be specifically enforced by the Principal Contractor throughout the construction period, as detailed further in Section 4.1.1.

3.6.2 Truck Parking

No truck parking or standing will be permitted in local roads, but rather all trucks travelling to the Site will be required to directly enter the Site or the Work Zone and load/unload fully within the Site or Work Zone.

4 Construction Management

4.1 On-Site Management

4.1.1 Staff Parking

As discussed in Section 3.6, no construction staff parking will be provided on-site, and the use of private vehicles by construction staff will be minimised further to the implementation of the CWTS.

4.1.2 Deliveries & Materials Handling

All deliveries and materials handling will occur on-site or within the approved Work Zone at all times, and as discussed in Section 3.6.2, all truck parking demand will be contained on-site.

4.1.3 Washdown Facilities

Washdown facilities will be provided on-site to ensure trucks are clean (and where necessary, appropriately covered) so as to minimise the potential for trucks to track dirt or debris onto the adjacent local roads.

4.1.4 Emergency Vehicle Access

Emergency vehicle access to and from the Site will be available at all times while the Site is occupied by construction staff; emergency protocols during the works will be developed by the Principal Contractor for inclusion in the CTPMSP.

4.2 Traffic and Pedestrian Management

4.2.1 Work Zones

As discussed, a Work Zone has been approved in Council utilising a 40m section of kerbside lane adjacent to Driveway 1.

At this time, it is not anticipated that other Work Zones (within the road reserve, i.e. off-site) will be required, i.e. that all other construction works and associated vehicle movements can be accommodated within the Site (notwithstanding the need for appropriate control at construction driveways – see also Section 4.2.2). If any other Work Zone is required, an approval for such would need to be obtained from Council following the same application process as required for the approved National Park Street Work Zone.

4.2.2 Pedestrian and Cyclist Management

Appropriate fencing will be provided along all Site frontages and internal boundaries (between the works areas and retained School areas); it is noted these boundaries may change a number of times during the construction period.

It is anticipated that the fencing will either be fencing panels (ATF) or 2.4m chain wire.

Secure gates will also be provided across Driveway 1 and Driveway 2, and remain closed at all times outside of the permitted construction hours.

The management of pedestrian and cyclist movements in the immediate vicinity of the Site – and specifically movements along the Smith Street and National Park Street footpaths across the construction driveways – will be carefully managed. As discussed in Section 3.4.1, trucks will not be permitted to enter or depart the Site during standard School Zone periods, which means that the potential for there to be pedestrians walking along the footpaths adjacent to Driveway 1 and Driveway 2 is minimal.

Notwithstanding, all truck movements to/from the construction driveways would occur under the direction of properly accredited persons to be engaged by the Principal Contractor.

When the construction driveways are not in use (during the workday) a separate barrier/gate would be placed across the construction driveway at the property line to prevent any unauthorised access.

4.3 Traffic Guidance Scheme

4.3.1 General Traffic Guidance Scheme Requirements

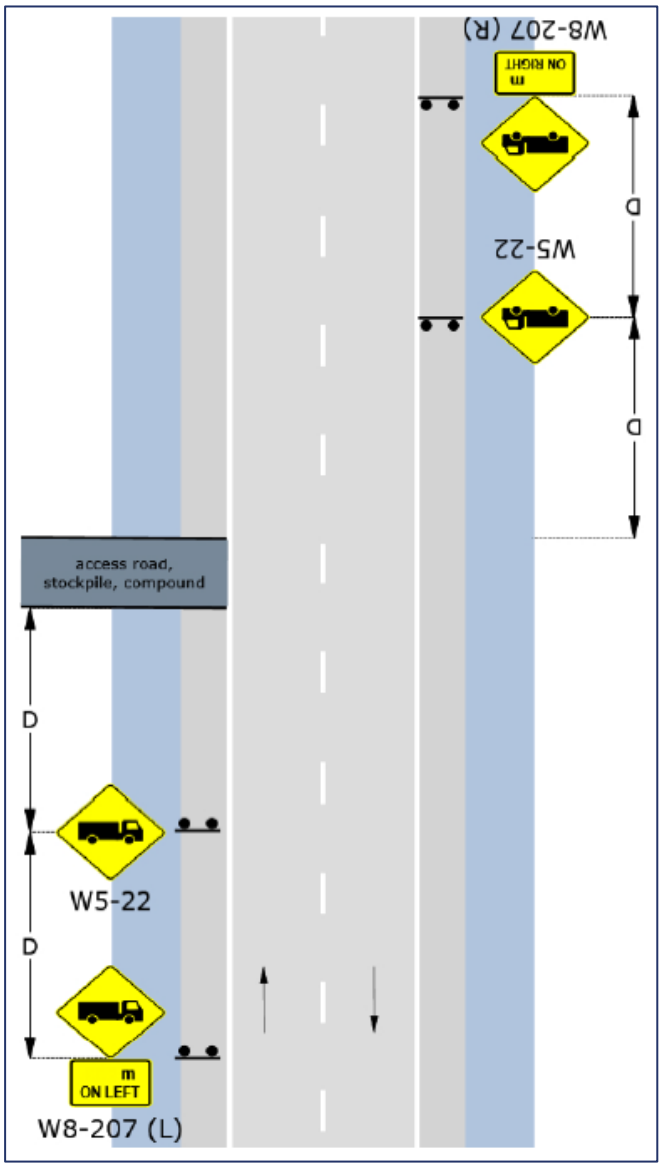
Further to Section 4.2.1, any submission for a Road Occupancy Licence (**ROL**) for additional Works Zones or other off-site works with the potential to impact local transport conditions will need to be accompanied by a detailed TGS (previously referred to as a Traffic Control Plan). The TGS will be prepared by persons accredited to *Prepare a Work Zone Traffic Management Plan* in accordance with the TCW Manual and AS1742.3.

Any TGS involving signage, traffic control or other potential changes to the operation of any roads providing access to/from the construction driveways will require consultation with and approval from Council prior to the construction works to which they relate.

With specific reference to the construction driveways in Smith Street and National Park Street, a TGS has been prepared referencing Section D.4.7 of the TCW Manual relating to *Static Work: Access to depot, stockpile, quarry, gravel pit etc. all roads*, formerly referenced as Traffic Control Plan 195. This will provide for the installation of signage on both approaches to the construction driveways in both Smith Street and National Park Street to heighten the awareness of drivers that trucks may be turning to and from the construction driveways.

The basic components of this TGS are in accordance with Figure 10 below, and the detailed TGS' for the construction driveways are provided as Appendix D.

Figure 10: Traffic Guidance Scheme: Static Work



Source: TCW Manual

4.3.2 Works Specific TGS

As discussed, a TGS is anticipated to be required for the following works:

- The construction of Driveway 2; and
- Any AV movements to/from Driveway 1.

An additional TGS may be required to control pedestrian/cyclist movements along the public path that runs along the northern boundary of the Site between Smith Street and National Park Street. Works within the Site along the northern boundary include the demolition of 2 buildings, and are anticipated to require the path to be closed for 2 – 3 days, as indicated in Figure 11.

Figure 11: Northern Path Temporary Closure

Source: Hansen Yuncken

A TGS supporting these temporary works would include consideration of the appropriate means of blocking access to the path at both Smith Street and National Park Street, as well as providing signage indicating an alternative pedestrian route, likely including public paths connecting Smith Street and National Park Street across the southern part of National Park to the north of the Site, or via Parkway Avenue.

Again, all TGS' will be prepared by accredited persons in accordance with the TCW Manual and AS1742.3, and require approval prior to any of the works they support commencing.

4.3.3 Authorised Traffic Controllers

At this time, it is anticipated that traffic control will be required to monitor truck movements to/from movements at the construction driveways; as discussed in Section 4.2, these movements would be supervised by properly accredited persons to be engaged by the Principal Contractor.

The other potential requirement for a TGS would be to provide for AV movements to/from Driveway 1.

Should additional traffic control be required external to the Site – most likely as a component of a TGS – traffic controllers may be required. Any such traffic control would be undertaken in accordance with the *Traffic Controller Accreditation Scheme*, and moreover by persons qualified by an Authorized Training Providers.

Each traffic controller would be required to have a copy of their qualification certificate available at all times during their supervision of construction works.

4.4 Principal Contractor Responsibilities

4.4.1 Site Induction

All construction staff (including truck drivers) will be properly inducted prior to commencing work on-site. The induction will detail the Site's construction safety protocols, including:

- General Site safety;
- Site access, amenities and general procedures;
- Truck movements and on-site parking;
- Neighbour consultation and notification requirements; and
- Project Management's policies and procedures.

4.4.2 Truck Movements

The Principal Contractor is required to take all steps necessary to ensure all truck movements are as safe as possible, and will not result in truck drivers operating under conditions that are unsafe. This will be achieved by undertaking the following:

- Ensuring all trucks are well maintained and that the equipment enhances driver, operator and passenger safety to as great an extent as practicable;
- Ensuring there are regular checks to ensure all trucks are leaving the Site appropriately covered and are not tracking dirt or debris off-site;
- Ensuring all truck drivers have a valid Verification of Competency for the class of vehicle they are driving;
- Identifying truck driver training needs and arranging appropriate training or re-training. This is anticipated to include truck driver competency assessments as part of all inductions, and regular Toolbox Talks on safety conditions, managing fatigue, approved truck routes and truck driver responsibilities; and
- Encouraging safe driving behaviour by not covering or re-imbursing staff for speeding or other infringement notices; ensuring the legal use of mobile phones only while driving; and providing training on, and circulating information about, travel planning and efficient truck driving habits.

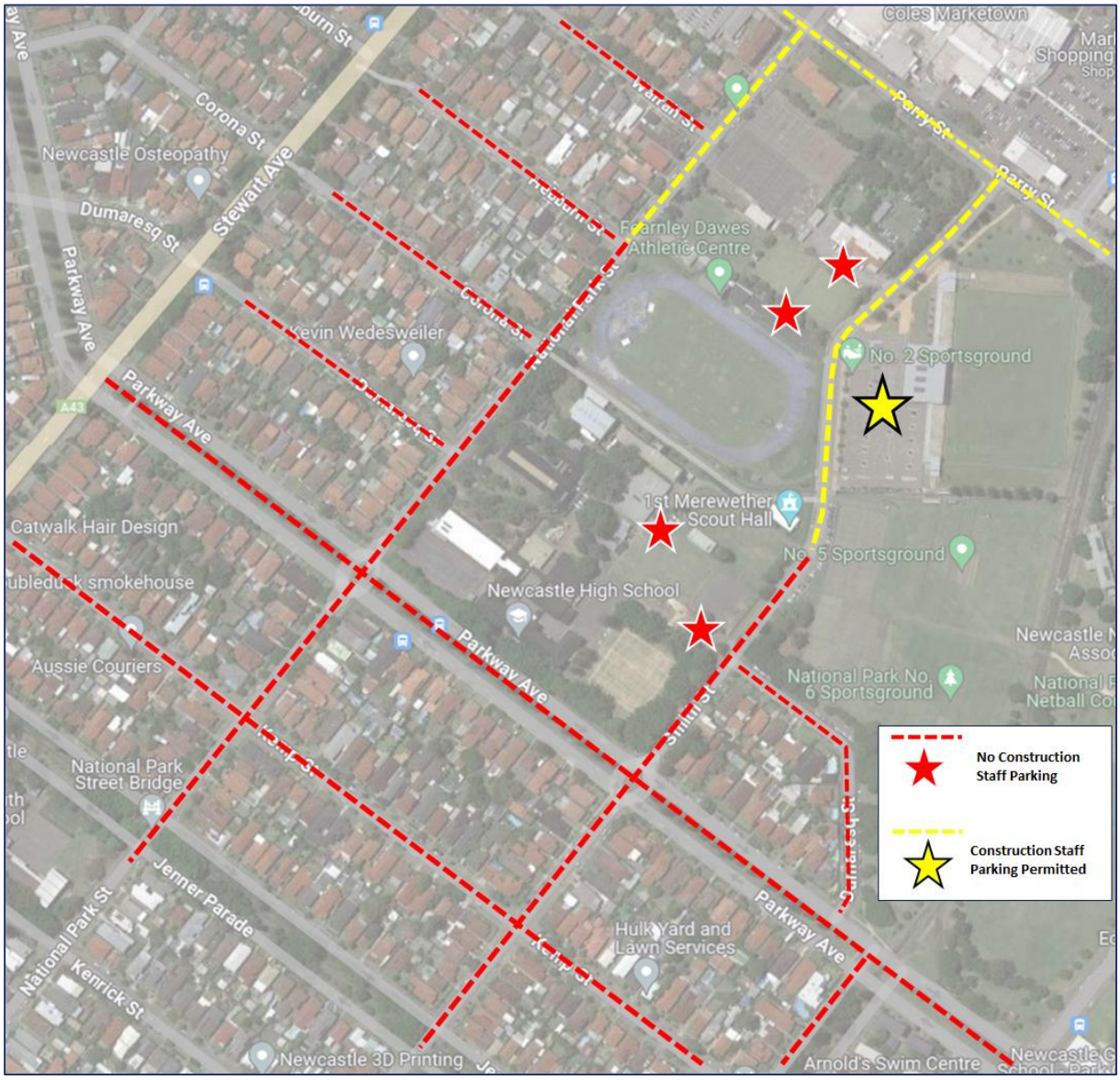
4.4.3 Construction Staff Parking

As discussed, no construction staff parking will be provided on-site, nor permitted to occur in local residential streets in the vicinity of the Site.

Available off-site parking has been identified in both the No.2 Sportsground Car Park and in Smith Street north of the Site, which provide primarily paid parking. Site observations and a review of historical Nearmap images indicate that there is significant spare capacity during weekdays in these parking areas, which only reach capacity outside of the approved construction hours.

A summary of where construction staff parking would and would not be permitted is provided in Figure 12.

Figure 12: Restricted and Permitted Off-Site Parking Locations



Source: Nearmap

It will be the responsibility of the Principal Contractor to ensure that construction staff vehicles are not parking in local residential roads in the immediate vicinity of the Site; this will be achieved by:

- Undertaking regular observations in local roads in the vicinity of the Site immediately prior to and following the work day to ensure that construction staff are not parking in local roads;
- Consultation with sub-contractors via Site inductions, pre-start meetings and tool box talks;
- Formal warning for those found to be continually parking in local roads;
- Re-induction of those that continue to parking in local roads; and

- A final warning if the parking practices persist, before ultimately being removed for work at the Site.

4.4.4 Communications Strategy

A Communications Strategy will be established and included in the CTPMSP. The Communications Strategy will outline the most effective communication methods to ensure adequate information is provided to relevant authorities and the local community, and will assist the Project Team to deliver any construction traffic changes with minimal disruption to the on and off-site vehicle, pedestrian and cyclist environment.

The Communications Strategy will include (as a minimum):

- The erection of signs providing advanced notice of works and/or any traffic control measures to be implemented (on or off-site);
- Written notices to surrounding residents who would potentially be impacted by the construction works (prior to commencement of those works); and
- A contact person from the Principal Contractor to answer construction related enquiries from stakeholders and local residents.
- A contact person from the School/SI NSW to answer general enquiries from stakeholders and residents.

Relevant contact details will also be affixed to the fencing around the Site.

4.4.5 CTPMSP Monitoring and Review

The development of a program to monitor the effectiveness of the CTPMSP will be established by the Principal Contractor.

The CTPMSP will be subject to ongoing review to further enhance the safety and efficiency of the construction works; any and all reviews will be documented by the Principal Contractor, with considerations for review potentially including the following:

- Tracking deliveries and general construction vehicle movements against estimated volumes;
- Identifying any shortfalls in the existing CTPMSP, and developing an updated action plan to address issues that may arise during construction (for example, parking or access issues);
- Ensuring that any TGS (where required) is updated by accredited persons to ensure they remain consistent with construction requirements and the intent of the CTPMSP; and/or
- Undertaking regular checks to ensure all loads are leaving the Site appropriately covered and without tracking materials onto adjacent roads.

4.4.6 Driver Code of Conduct

A Driver Code of Conduct (**Driver COC**) will be strictly enforced by the Principal Contractor throughout the construction period. The objectives of the Driver COC include:

- Minimising the impact of truck and company vehicle movements on the on-site work environment and local road network;
- Minimising conflict with other on and off-site road users;
- Minimising truck traffic noise by ensuring that vehicles have correctly been fitted with mufflers to minimise noise disturbance, and use only the approved construction vehicle routes during approved construction hours so as to minimise noise impacts in residential and urban areas; and
- Ensuring truck drivers use the designated truck routes.

The Driver COC will also require that, while driving any truck or company vehicle for construction related purposes, drivers must:

- Demonstrate safe driving and road safety activities;
- Abide by traffic and road legislation;
- Abide by on and off-site speed limits at all times; and
- Follow Site signage and instructions at all times.

The detailed Driver COC is provided in Appendix D.

4.5 Road Dilapidation Protocols

4.5.1 Road Dilapidation Surveys

Road dilapidation surveys involve a careful inspection of existing road conditions prior to the commencement of any project that might lead to an increase in the volume of traffic the road is expected to handle.

A suitably qualified and independent inspector would conduct an inspection that encompasses various factors, including drainage, potholes and road surface cracks and formation. Further to the initial inspection, they will compile a comprehensive report that includes detailed descriptions and accompanying photographs of the existing conditions.

Additional surveys would then be undertaken towards to end of the construction period to ensure that any impacts arising from the increased traffic due resulting from the construction are appropriately addressed. The ultimate objective is to ensure that all key roads are returned to a condition equal to or better than their state prior to the commencement of the construction period.

Importantly, the condition of the public footpath, access lane to the Scout Hall and the culvert all along the northern border of the Site will also be included in the dilapidation protocols/surveys.

4.5.2 Survey Locations

Based on the potential for construction related vehicles to impact the condition of local roads, as well as the public infrastructure along the northern boundary of the Site, the dilapidation protocols/surveys will apply to the locations shown in Figure 13 below, noting the inclusion of Parkway Avenue between National Park Street and Stewart Street as specifically requested by Council.

Figure 13: Road Dilapidation Protocol Locations

Source: Nearmap

4.5.3 Survey Schedule

At a minimum, it is anticipated that the surveys will be undertaken prior to construction commencing, and then within 1 month prior to the completion of construction.

4.5.4 Periodic Inspections

In addition to the formal dilapidation surveys, the Principal Contractor will be responsible for overseeing periodic visual inspections of the abovementioned roads and public lands so as to address in a timely manner any road defect issues. It will also be part of the Driver Code of Conduct for all drivers to immediately inform the Principal Contractor of any road defects that pose a safety or other risks.

4.5.5 Road Repairs

If the need for repairs to the access roads arise, the Principal Contractor will consult with Council to define the extent of the necessary actions and identify the most efficient and sustainable methods for restoring these road sections. In cases of urgent repairs, it may be necessary to suspend construction vehicle operations until the remedial measures are executed.

5 Conclusions

Further to an assessment of the access, traffic and parking characteristics of the proposed construction of the Campus and associated infrastructure, arc traffic + transport has concluded that the construction works can be undertaken in a safe and efficient manner without impacting the local road environment. In summary:

- Access to the Site for construction vehicles will be limited to a single construction driveway in both Smith Street and National Park Street.
- Construction trucks will be restricted to designated routes based on their size so as minimise impacts on lower order roads;
- The trip generation of the Site during all stages of construction is verry moderate, would have no significant impact on the operation of local roads and intersections during what will be a relatively short construction period;
- Construction staff parking demands will be limited further to the use f public and active transport services which provide a more than viable alternative to private vehicle trips.
- While some construction staff may use private vehicles, they are anticipated to use the No. 2 car park and on-street parking in Smith Street north of the Site; a policy of no construction staff parking in local residential roads in the vicinity of the Site will be strictly enforced by the Principal Contractor.
- OHW Permits, OSOM Permits and TGS will be prepared as required through the construction period by qualified personnel; approval for each by TfNSW and/or Council would be required prior to any works associated with these permits/schemes commencing;
- Traffic controllers will be engaged to maximise the safety of pedestrian movements along the footpaths adjacent to the construction driveways;
- Hansen Yuncken and other contractors will implement comprehensive construction management strategies and protocols through the construction period to maximise the on and off-site safety of construction staff and the general public;
- The CTPMSP will be reviewed throughout the construction period, and appropriately updated as required.

In summary, arc traffic + transport has determined that the construction of the Campus in line with this CTPMSP can be undertaken without any significant road network or safety impacts.

Appendix A: Anton Reisch and Julius Boncato Curriculum Vitae

ANTON REISCH CURRICULUM VITAE

Anton excels in the detailed assessment of traffic and parking generating developments, and urban and strategic planning projects. His range of work has extended from small dwelling renovations through to residential subdivisions, shopping centres, schools, churches, commercial, industrial, mining and major infrastructure projects. Anton's reports provide the clear and precise detail required to meet and exceed the expectations of clients, while his communication with local and State government authorities and key stakeholders is second to none; a collaborative approach will always provide the best results.

Anton retains a fierce independence in his approach to any assessment task. This has been instrumental in the establishment of a large and loyal client base, from small architectural firms through to national and multi-national corporations and local and State government agencies.

Personal

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Education

BA (USyd):	1990 - 1992
Master Urban & Regional Planning (USyd):	1993 – 1995

Employment

Stapleton & Hallam	1993 - 1994
Christopher Stapleton Consulting	1994 - 2004
Stapleton Transportation & Planning	2004 - 2011
arc traffic + transport	2011 - 2018
Ason Group	2018 - 2020
arc traffic & transport	2020 - Present

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Local Government Projects

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Mr Peter Lawrence
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Phone: +61 402 181 571

Regional Projects

Mr Stephen Richardson
Director, Cowman Stoddart
Phone: +61 2 4423 6198

Precinct Planning

Mr Murray Donaldson
Director, Urbis
Phone: +61 2 8233 9900

CURRICULUM VITAE

YEARS OF EXPERIENCE

7 years

QUALIFICATIONS & AFFILIATIONS

BE (Civil)

MIEAust

Member AITPM

Member IPWEA

SafeWork NSW – Work Health & Safety Traffic Control Work (PWZ)

Level 2 Road Safety Auditor

KEY SKILLS & COMPETENCIES

Traffic & Parking Impact Assessments

SIDRA Traffic Modelling

Road Safety Audits

Car Park Design

Car Park & Loading Dock Audits

Traffic Management Plans

Loading Dock Management Plans

Design Development & Compliance Statements for Construction & Occupation Certificates

Peer Review

Data Analysis

PROFESSIONAL BACKGROUND

2017-Present - PDC Consultants

JULIUS BONCATO

SENIOR TRAFFIC ENGINEER

PROFESSIONAL OVERVIEW

Julius is a competent traffic engineer with expertise in the areas of traffic engineering and transport planning. Julius has been involved in several development and infrastructure projects, varying in land-use and scale, and has been involved in all project aspects from design and development, through to construction. This experience allows Julius to provide strategic and specialist advice on transport planning issues that ensure the best possible outcome on all projects he is involved in.

Julius is a very effective communicator and a skilled user of many transport related software packages, including, SIDRA Intersection, AutoCAD, Vehicle Tracking and RapidPlan.

RELEVANT PROJECT EXPERIENCE

TRAFFIC & PARKING IMPACT ASSESSMENTS

Winter Sports World
Jamison Rd, Penrith

Cabramatta East Precinct
Cabramatta Rd E, Broomfield St and Fisher St, Cabramatta

Big Bear Shopping Centre
Military Rd, Neutral Bay

Liverpool West Public School
Hoxton Park Rd, Liverpool

Bexley Bowling Club
Laycock St, Bexley North

Mixed-Use Development
Segers Ave, Padstow

Canada Bay Club
William St, Five Dock

Uniting Residential Aged Care & Independent Living Units
Freeburn St & Yamba Rd, Yamba

Roly-Poly Early Learning Centre
Clovelly Rd, Clovelly

Warehouse Development
Interchange Park, Eastern Creek

New High School in Bungendore
Majara Street, Bungendore

Mixed-Use Development
Castlereagh St, Haymarket

TRAFFIC MANAGEMENT PLANS

Yennora Distribution Centre
Loftus Rd, Yennora

Showground Business Park
Anella Ave, Castle Hill

Hendra Industrial Estate
Nudgee Rd, Nudgee

Great West Distribution Centre
Great Western Hwy, Arndell Park

Big Bear Shopping Centre
Military Rd, Neutral Bay

Ingleburn Logistic Park
Stennett Rd, Ingleburn

Moorebank Distribution Centre
Helles Ave, Moorebank

Chullora Business Park
Hume Hwy, Chullora

PolAir Facility
Bankstown Airport, Bankstown

Parramatta West Public School
Young St, Parramatta

Domremy College
First Ave, Five Dock

Forrester Distribution Centre
Forrester Rd, St Marys

DESIGN DEVELOPMENT & COMPLIANCE STATEMENTS FOR CONSTRUCTION CERTIFICATE

PolAir Facility
Bankstown Airport, Bankstown

Park One
Waterloo Rd, Macquarie Park

Domremy College
First Ave, Five Dock

Boomerang Tower
Olympic Blvd, Sydney Olympic Park

Uniting Mayflower Westmead
Caroline St, Westmead

Mixed-Use Development
Old Princes Hwy, Sutherland

Appendix B: Correspondence

arc traffic + transport to Transport for NSW

Newcastle Education Campus Construction Traffic & Pedestrian Management Sub-Plan

AR

Anton Reisch <antonreisch@optusnet.com.au>
To 'liz.smith@transport.nsw.gov.au'
Cc 'Jordan Watters'

Reply | Reply All | Forward

Fri 16/02/2024 12:08 PM

P0406r2v2 Newcastle Education Campus Construction Worker Transportation Strategy.pdf
2 MB

P0406r1v2 Newcastle Education Campus CTPMSP.pdf
3 MB

Good afternoon Liz,

Corrine was good enough to pass on your details…we are current preparing the CTPMSP for the Newcastle Education Campus on behalf of Hansen Yuncken. In accordance with the SSD Consent, we are seeking any feedback that TfNSW may have in regard to the CTPMSP, and as such I have attached our draft CTPMSP which I am hoping you can review and provide any comments so that we can revise if necessary and then provide to the Department for approval to get construction going.

I have also attached a Construction Worker Transportation Strategy which will be included as an appendix to the CTPMSP.

If you require any further information or wish to discuss anything further, please don't hesitate to get in touch with me at your convenience.

Many thanks in advance Liz, and kind regards,

anton

traffic + transport

anton reisch. director
m. +61 427 995 160
a. 19 canoon road, south turramurra, NSW 2074
e. antonreisch@optusnet.com.au
w. www.arctt.com.au

arc traffic + transport to City of Newcastle Council

FW: Newcastle Education Campus Construction Traffic & Pedestrian Management Sub-Plan

AR Anton Reisch <antonreisch@optusnet.com.au>
To 'traffic@ncc.nsw.gov.au'

Reply | Reply All | Forward

Mon 19/02/2024 2:20 PM

P0406r2v2 Newcastle Education Campus Construction Worker Transportation Strategy.pdf 2 MB

P0406r1v2 Newcastle Education Campus CTPMSP.pdf 3 MB

Good afternoon Newcastle Traffic People!

arc traffic + transport is currently preparing the CTPMSP for the Newcastle Education Campus on behalf of Hansen Yuncken and School Infrastructure. In accordance with the SSD Consent, we are seeking any feedback that Council may have in regard to the CTPMSP, and as such I have attached our draft CTPMSP which I am hoping you can review and provide any comments so that we can revise if necessary and then provide to the Department of Planning for approval to get construction going.

I have also attached a Construction Worker Transportation Strategy which will be included as an appendix to the CTPMSP.

If you require any further information or wish to discuss anything further, please don't hesitate to get in touch with me at your convenience.

Many thanks in advance, and kind regards,

Kind regards,

anton

traffic + transport

anton reisch. director
m. +61 427 995 160
a. 19 canoon road, south turramurra, NSW 2074
e. antonreisch@optusnet.com.au
w. www.arctt.com.au

City of Newcastle Council to arc traffic + transport

RE: Newcastle Education Campus CTMP

Reply | Reply All | Forward

Wed 21/02/2024 2:31 PM

T Traffic <traffic@ncc.nsw.gov.au>
To Anton Reisch; Traffic

You replied to this message on 21/02/2024 2:54 PM.
Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

Good afternoon Anton,

I can confirm your email and associated CTMP was received and is with the traffic engineer for review.

If there is anything we can assist with in the meantime, please do not hesitate to contact us.

Kind regards,

Rebecca | Business Support Officer
City of Newcastle | Planning & Environment
Planning, Transport & Regulation | Business & Customer Improvement
T: +61249742000

The linked image cannot b...
Newcastle is a liveable, sustainable, inclusive global city.
Cooperation | Respect | Excellence | Wellbeing

Newcastle Education Campus Construction Traffic & Pedestrian Management Sub-Plan

Reply | Reply All | Forward

Fri 23/02/2024 11:35 AM

AV Aaron Visser <avisser@ncc.nsw.gov.au>
To antonreisch@optusnet.com.au
Cc Traffic

You forwarded this message on 23/02/2024 1:36 PM.
Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

Hi Anton,

Thanks for passing this through.

Regarding the draft *Construction Traffic & Pedestrian Management Sub-Plan Newcastle Education Campus*, see my comments below:

1. Driveway 2 is not existing. It is only a personnel gate connecting to footpath. Additional consideration must be given to the necessary applications/permits needed to facilitate this crossover - however temporary/permanent it will be:
   a. A Work Zone permit can be used to clear parking from the vicinity of any temporary layback.
   b. Unless covered by a separate approval, a Type 1 S138 application needs to be approved by CN to add a driveway or augment a driveway in the road reserve for this project (it may not be necessary for the driveway works you intend, but this cannot be determined without you first seeking an application of this nature and providing plans to be considered).

2. The claim that HRV swept-paths succeed in accounting for AV swept-paths is noted. However, swept-path assessments only show HRV/MRV turnaround manoeuvres, not AV turnaround manoeuvres. Please either:
   a. Confirm internal roads exist which link, or will link, driveway 1 with driveway 2 that removes the need for an AV to turnaround in the off-street area; or
   b. Provide swept-path analyses showing an AV can turnaround off-street, or an explanation of the methodology to be used to get them safely back onto the road.

3. Noting that discussions elsewhere have likely occurred on this topic and may speak to the following, I would suggest extending the dilapidation survey to include all of Parkway Avenue between Smith Street and Stewart Avenue if at all possible.

Further comments can be provided as needed on yet to be completed components of this plan if a 'completed' draft is provided to us.

I have no comments regarding the draft *Construction Worker Transportation Strategy Newcastle Education Campus* document.

Please reach out for discussion as needed.

Kind regards,

Aaron Visser | Senior Traffic Engineer
City of Newcastle | Planning & Environment
Planning, Transport & Regulation | Traffic
E: avisser@ncc.nsw.gov.au | T: +61249741412

The linked image cannot b...
Newcastle is a liveable, sustainable, inclusive global city.
Cooperation | Respect | Excellence | Wellbeing

TfNSW to arc traffic + transport

RE: Newcastle Education Campus CTMP

LS Liz Smith <Liz.Smith@transport.nsw.gov.au>
To 'Anton Reisch'

Reply | Reply All | Forward | ...
Wed 21/02/2024 2:41 PM

You replied to this message on 13/03/2024 11:31 AM.

Hi Anton, apologies yes I have received. Just looking internally for relevant parties to review. TfNSW will respond to you in due course.
I note this one had a working group with TfNSW reps involved but the relevant docs are missing from the appendix.
Can you please confirm who may have attended these working group meetings on behalf of TfNSW?
Thanks Liz

Liz Smith
Manager Development Services North
M 0411149655

FW: Newcastle Education Campus CTMP

LS Liz Smith <Liz.Smith@transport.nsw.gov.au>
To Anton Reisch
Cc Nicholas Trajcevski; Corinne Thompson

Reply | Reply All | Forward | ...
Thu 14/03/2024 6:25 AM

You replied to this message on 14/03/2024 10:01 AM.

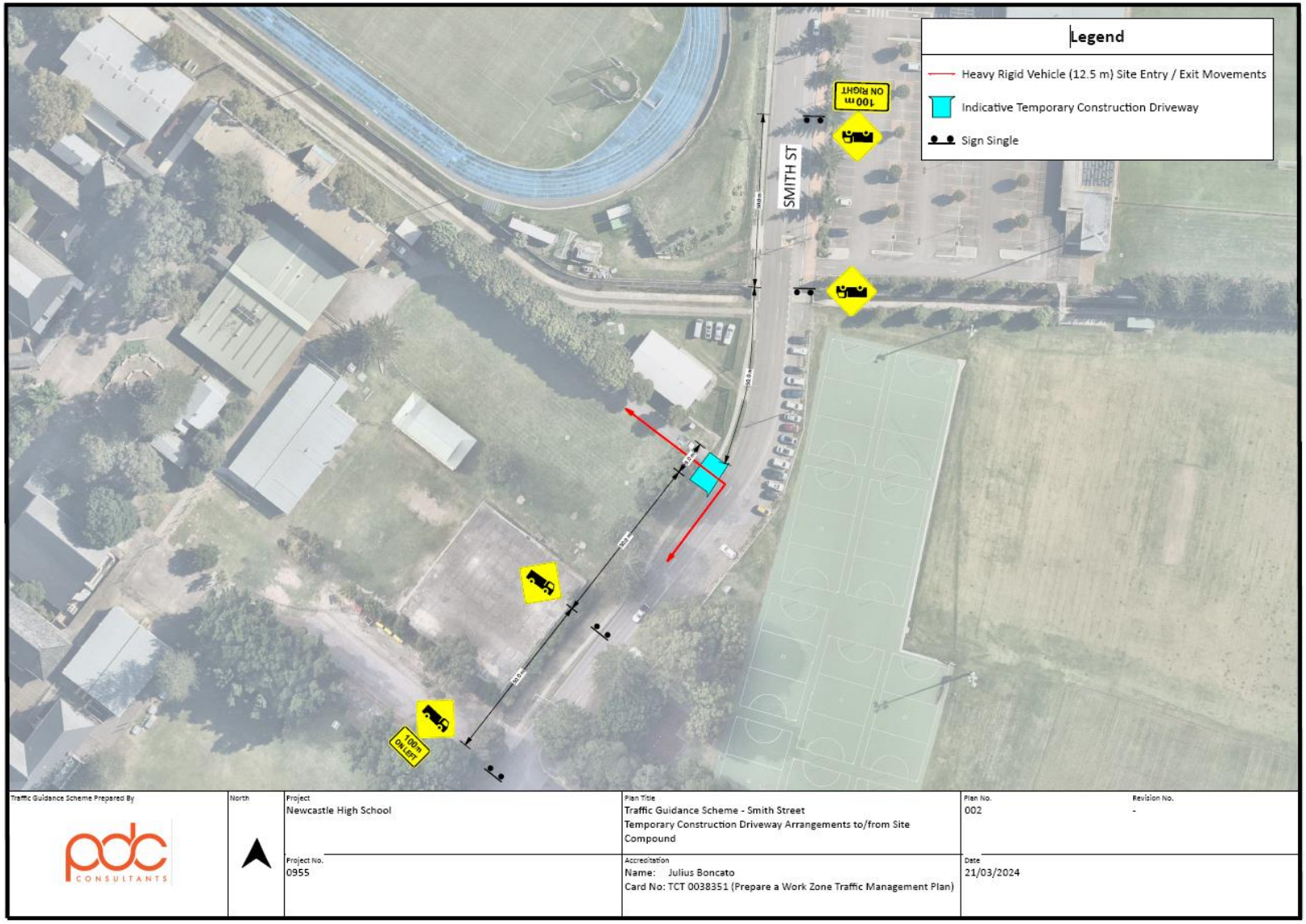
Hi Anton, this has been handed over the Community Partnering team for review and response.
The contact is Nicholas Trajcevski, cc'd into this email.
Cheers Liz

Appendix C: Traffic Guidance Scheme - Construction Driveways

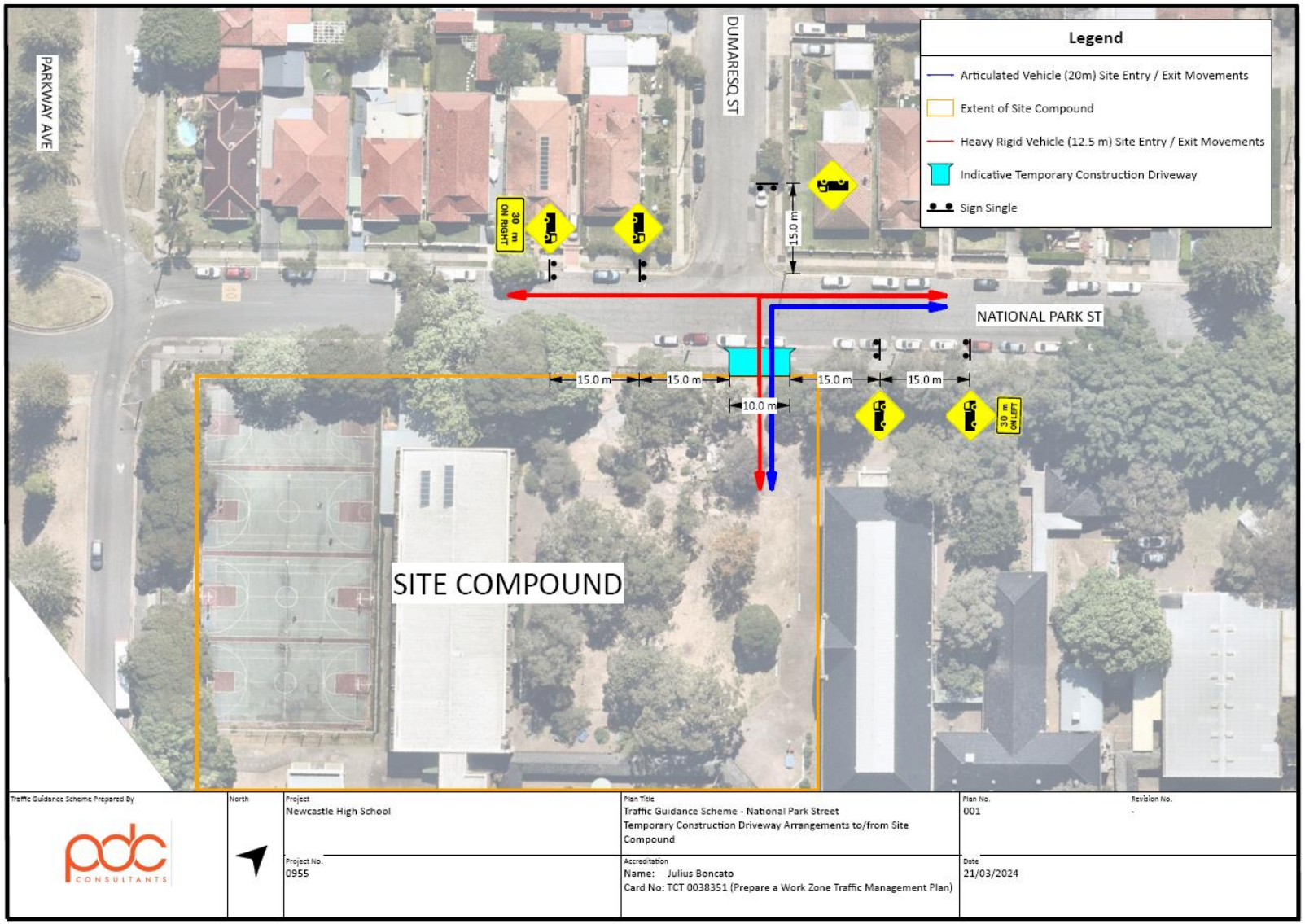
Prepared by Julius Boncato

Card No: TCT 0038351 - Prepare a Work Zone Traffic Management Plan

Traffic Guidance Scheme Driveway 1



Traffic Guidance Scheme Driveway 2



Appendix D: Driver Code of Conduct

Driver Code of Conduct

1 Driver Code of Conduct Objectives

This Driver Code of Conduct is to be provided to all truck and company vehicle drivers accessing the Site. The objectives of the Driver Code of Conduct include:

- Minimising the impact of truck and company vehicle movements on the on-site work environment and local road network;
- Minimising conflict with other on and off-site road users;
- Minimising truck traffic noise; and
- Ensuring truck drivers use the designated truck routes.

The Driver Code of Conduct also requires that, while driving any truck or company vehicle for construction related purposes, drivers must:

- Demonstrate safe driving and road safety activities;
- Abide by traffic and road legislation;
- Abide by on and off-site speed limits at all times; and
- Follow Site signage and instructions at all times.

2 Key Driver Controls

Truck Operating Periods

The delivery of materials to/from the Site will be as follows:

- School days:
  - 7:00am – 8:00am;
  - 9:30am – 2:30pm; and
  - 4:00pm – 6:00pm.
- Weekdays (school holidays):
  - 7:00am – 6:00pm;
- Saturdays:
  - 8:00am to 1:00pm.

No construction or construction truck movements are permitted on Sundays or public holidays, and – with reference to the weekday work hours above, no truck movements will be permitted to/from the Site during standard School Zone periods.

Where is it necessary for a truck to enter/depart the Site during the periods 8:00am – 9:30am or 2:30pm – 4:00pm on a school days, these movements will only be permitted further to the express approval of the [School] Principal and the Principal Contractor.

Where it is necessary for any truck movements to occur outside of the conditioned truck movement hours before or after the standard workday (not including the School peak restrictions) an approved OHW Permit will be required prior to any such truck movements. The Principal Contractor must be notified of any intention for truck movements outside of the approved construction hours, and provide approval for the OHW Permit application prior to its submission to the relevant authorities.

Speed Limits

All truck, company vehicle and general construction staff drivers are to travel within the posted speed limits in the public road network at all times.

All truck, company vehicle and general construction staff drivers are to travel at a speed of no greater than 15km/h within the Site at all times.

Site Access

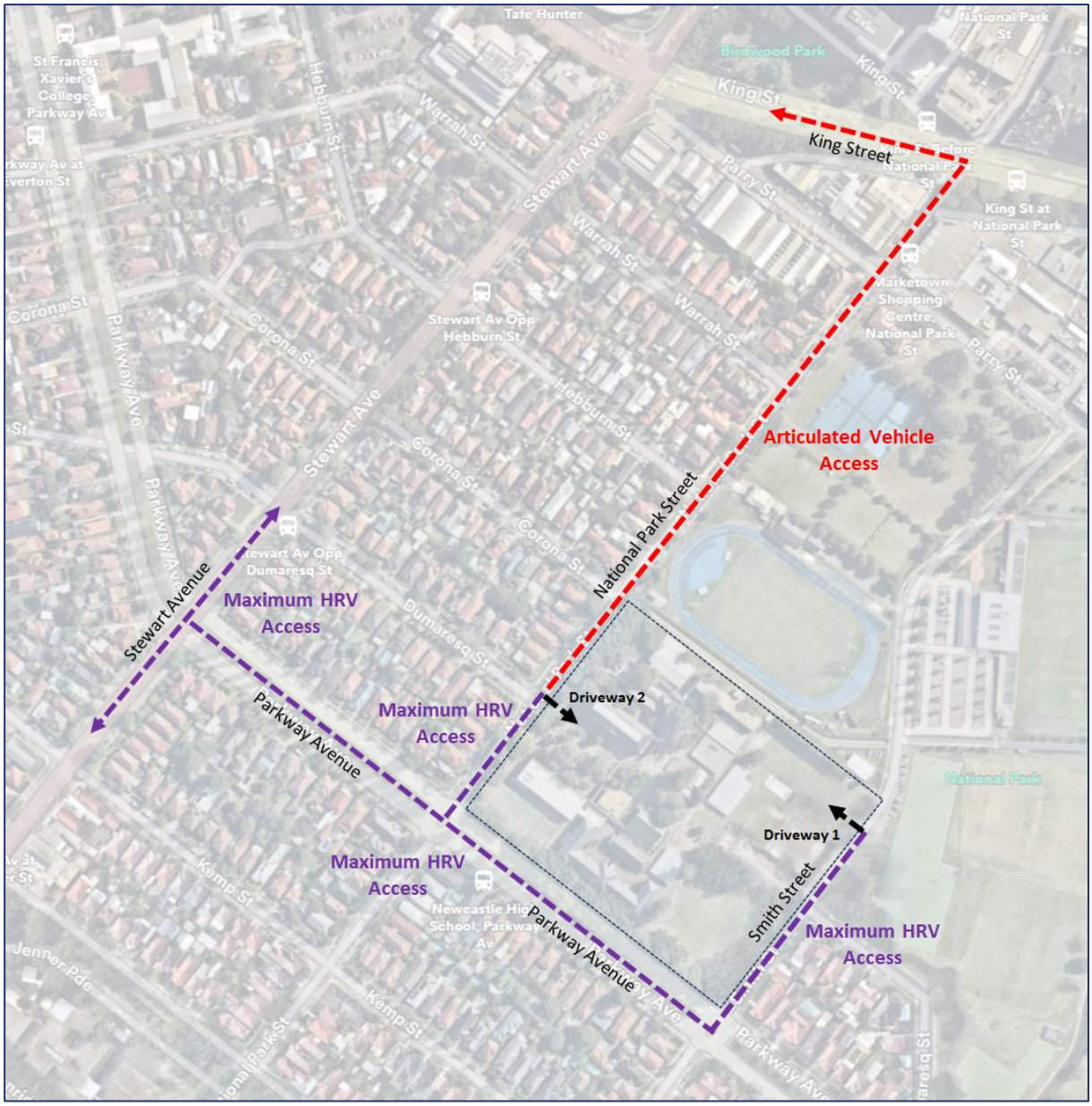
Site access will be provided via Smith Street (**Driveway 1**) and National Park Street (**Driveway 2**). These construction driveways are shown below, noting that all vehicles are strictly required to enter and depart the Site in a forward direction.

Site Access Driveways

Designated Truck Routes

Designated truck routes must be used by all truck drivers at all times for travel to/from the Site; these routes are shown below, noting that no Articulated Vehicle access will be permitted to Driveway 2 from Parkway Avenue; and that no Articulated Vehicle access will be permitted to Driveway 1 without prior approvals from Council.

Designated Truck Routes



3 Breach of Driver Code of Conduct

The following activities by any truck or company vehicle driver would be considered as a breach of the Driver Code of Conduct:

- Reckless or dangerous driving causing injury or death;
- Driving whilst disqualified or not correctly licensed;
- Drinking or being under the influence of drugs while driving;
- Failing to stop after an incident;
- Loss of demerit points leading to suspension of licence;

- Any actions that warrant the suspension of a licence; and/or
- Exceeding the speed limits in place in public roads and on-site.

Any drivers found to be in breach of the Driver Code of Conduct will be notified of the breach, as would their immediate managers, who would in turn be required to provide additional training/guidance to the driver. **Any repeat offenders would be prevented from returning to Site**.

4 Driver Responsibilities

All truck and company vehicle drivers must:

- Be responsible and accountable for their actions when operating a truck or company vehicle;
- Ensure they have a current driver licence for the class of vehicle they are driving, and this licence is to be carried with them at all times;
- Immediately notify their manager if their drivers licence has been suspended, cancelled, or has had limitations applied;
- Comply with all traffic and road legislation when driving;
- Regularly check the operating condition of trucks or company vehicles;
- Ensure their vehicles have correctly been fitted with mufflers to minimise noise disturbance, and use only the approved construction vehicle routes during approved construction hours so as to minimise noise impacts in residential and urban areas;
- For truck drivers, not drive along routes other than the designated truck routes;
- Never drive under the influence of alcohol or drugs;
- Wear a safety seat belt at all times when in the vehicle;
- Report any near-misses, crashes or scrapes to their manager, including those that do not result in injury;
- Report infringements to a manager at the earliest opportunity;
- Report vehicle defects to a manager prior to the next use of the vehicle; and
- Keep loads covered at all times (where relevant).

5 Crash or Incident Procedure

In the event of a crash or other traffic incident, the truck or company vehicle driver is required to:

- Stop the vehicle as close to it as possible to the scene, making sure this not hindering traffic;
- Ensure one's own safety first, then help any injured people and seek assistance immediately if required;
- Ensure that key information is exchanged with the other driver, including the registration, names and insurance details of other vehicles/drivers;

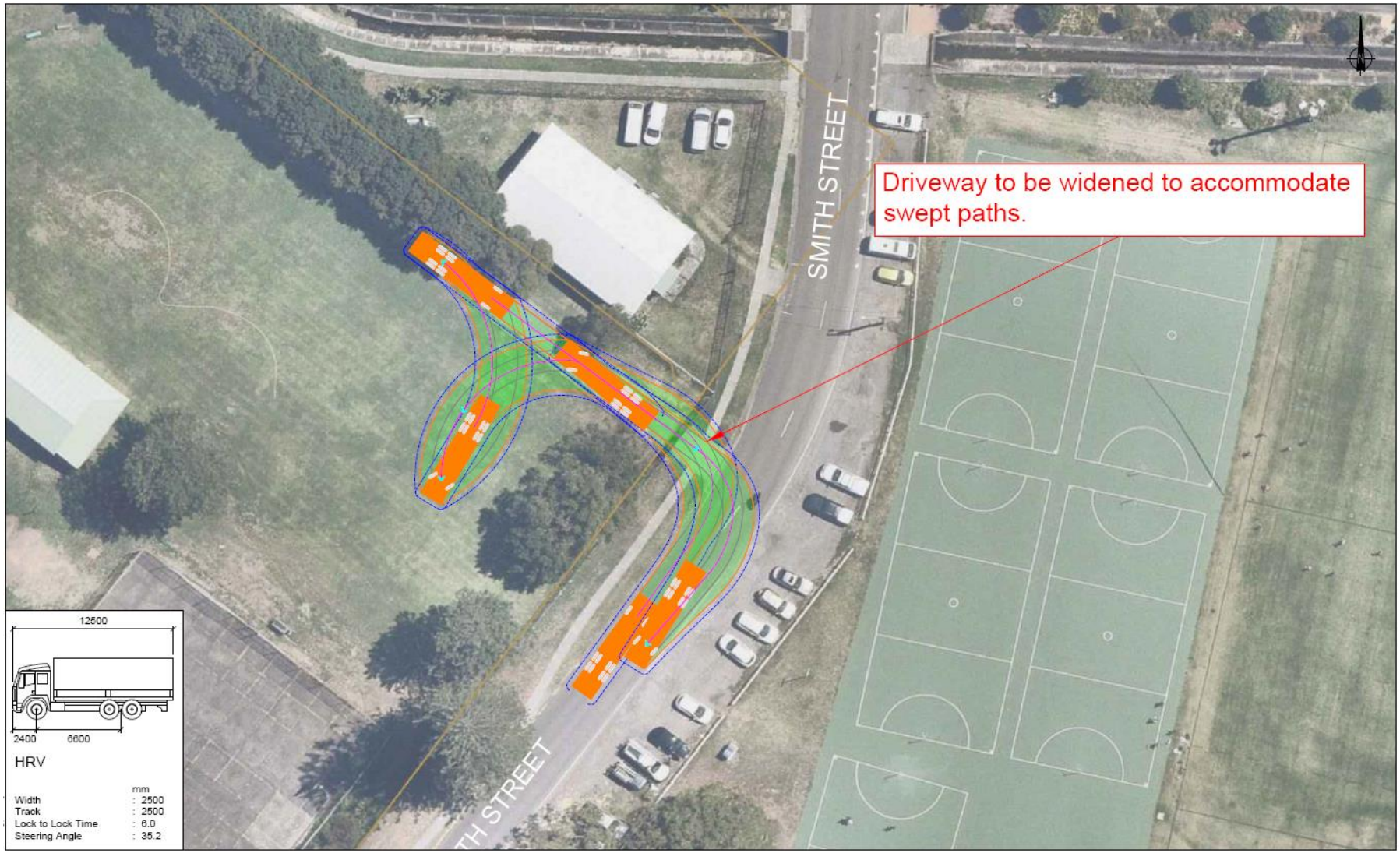
- Ensure that the police are contacted should there be a disagreement over the cause of the crash, if there are injuries or if property is damaged; and
- As soon as reasonably practical, report all details gathered to the Principal Contractor.

Appendix E: Construction Worker Transportation Strategy

Provided as a separate document.

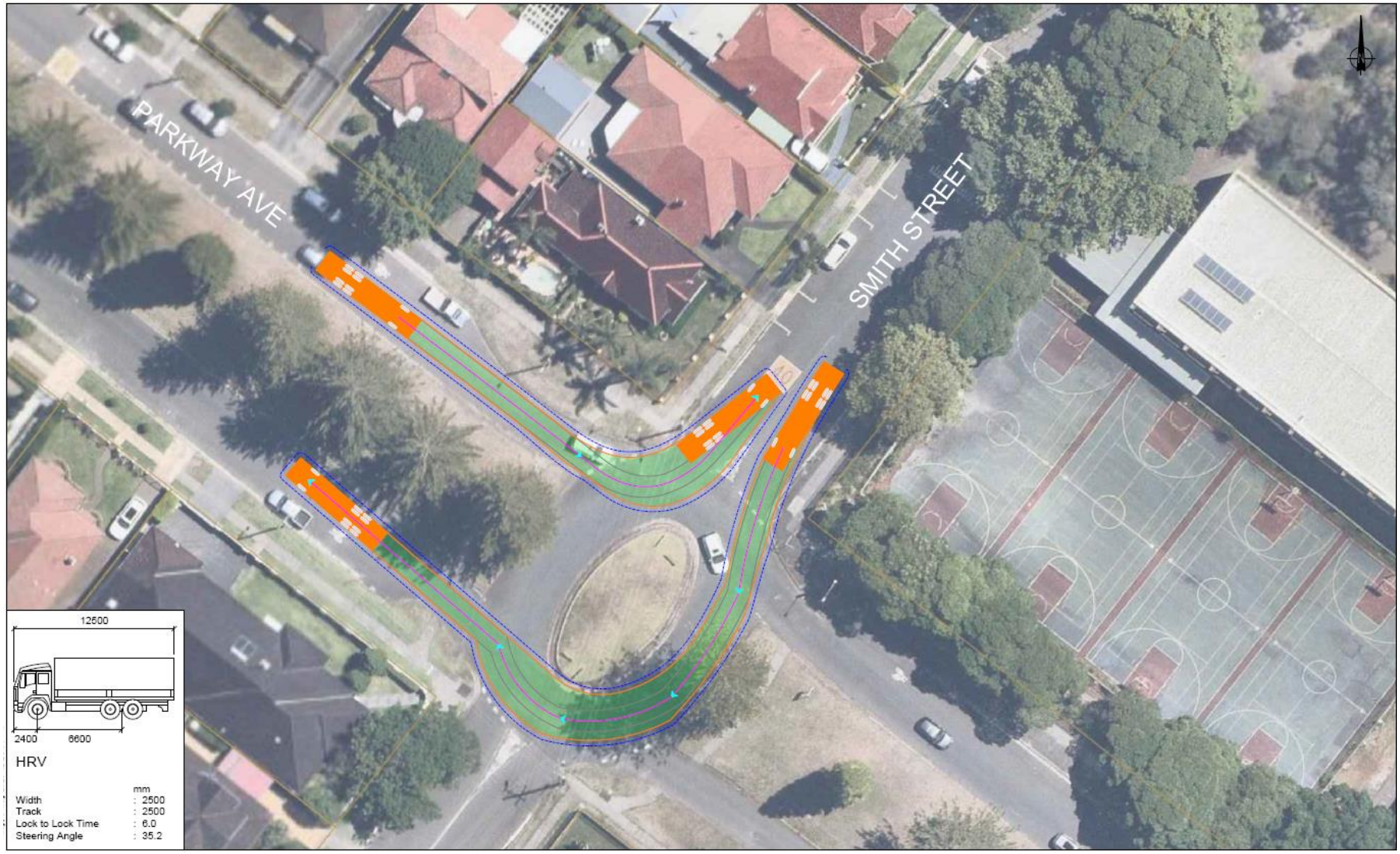
Appendix F: Swept Path Figures

Heavy Rigid Vehicle Access Smith Street Construction Driveway 1 and Internal

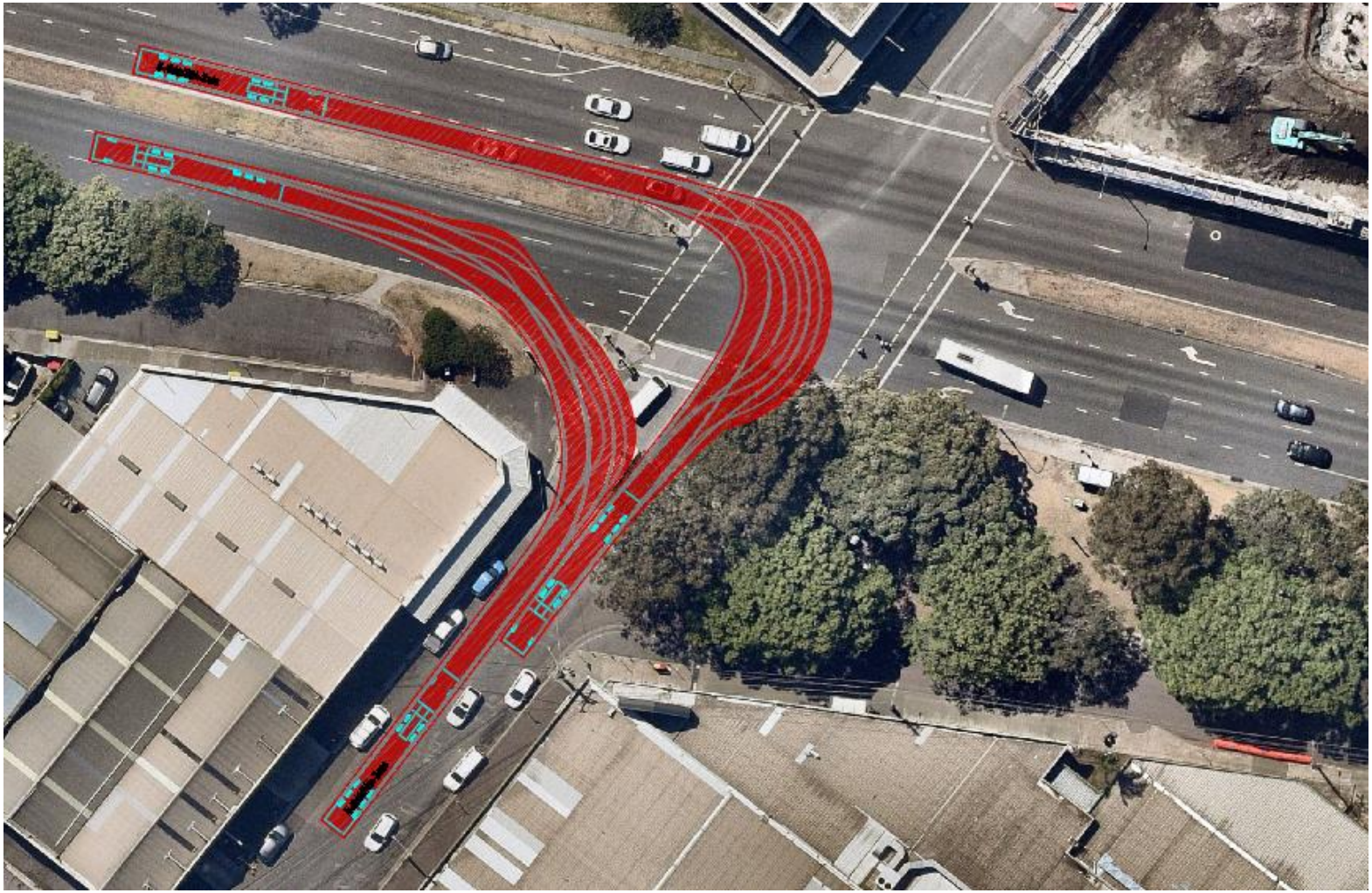


Heavy Rigid Vehicle Access National Park Street Construction Driveway 2 and Internal

Heavy Rigid Vehicle Access Intersection of Parkway Avenue & Smith Street

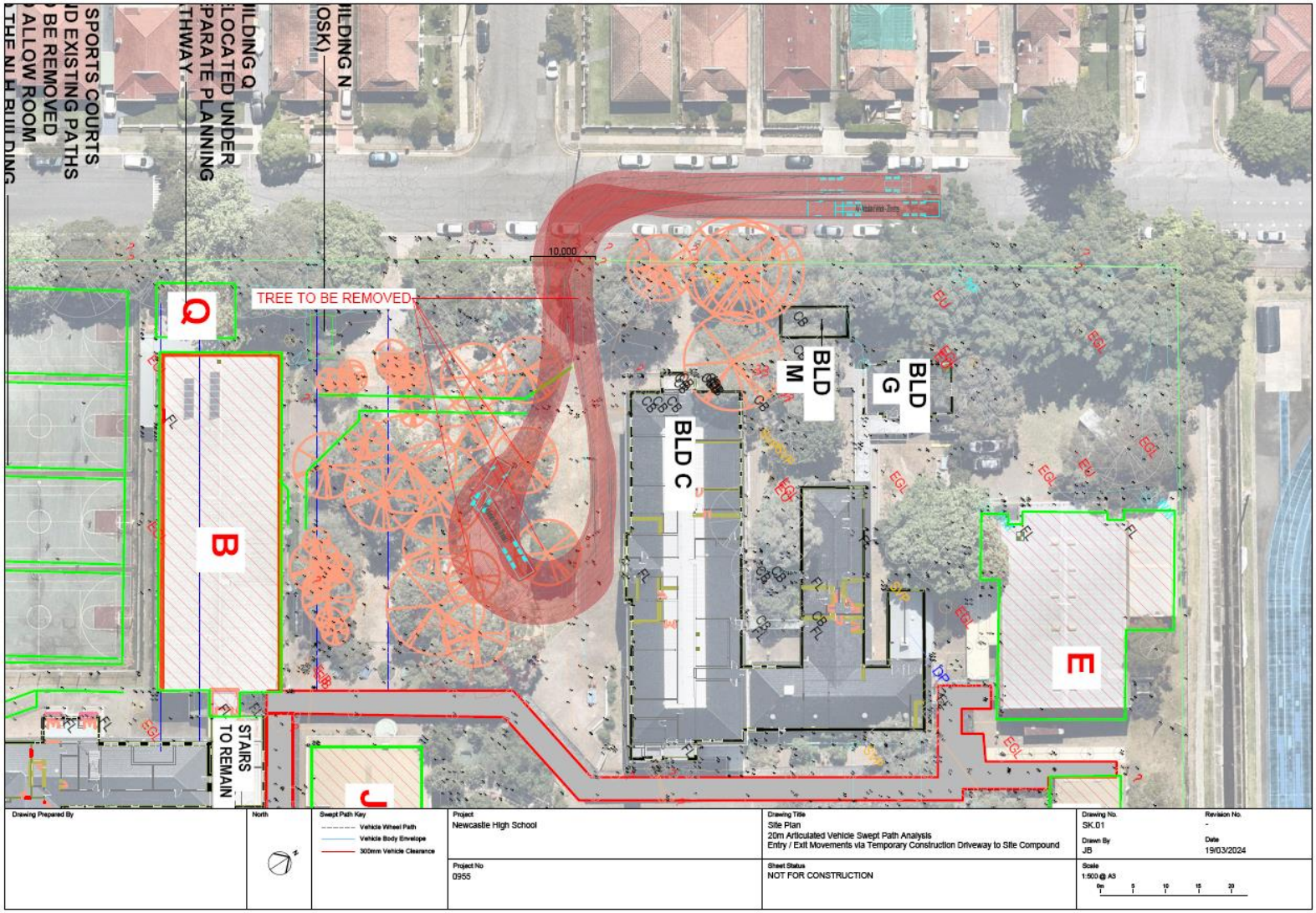


Articulated Vehicle Access King Street & National Park Street



Source: PDC Consultants

Articulated Vehicle Access National Park Street Construction Driveway 2 and Internal

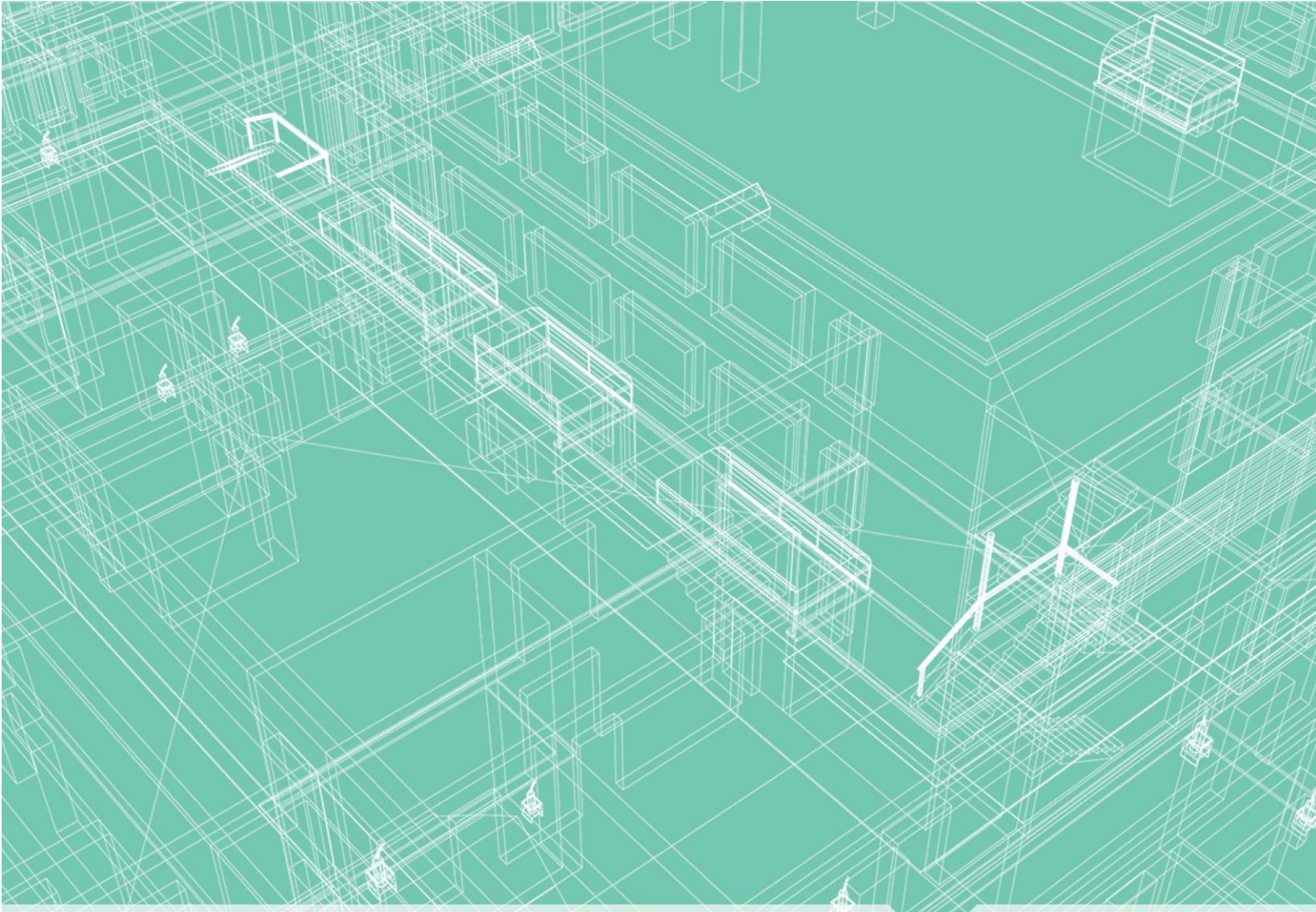


Source: PDC Consultants

Appendix G: Newcastle High School Redevelopment CTPMSP Version 1

As provided to Council and TfNSW for consultation, provided as a separate document.

A.6 Construction Noise and Vibration Management Sub-Plan (CNVMSP)



CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

NEWCASTLE HIGH SCHOOL REDEVELOPMENT (NHSR)

ACOUSTIC SERVICES

JHA

JHASERVICES.COM

This report is prepared for the nominated recipient only and relates to the specific scope of work and agreement between JHA and the client (the recipient). It is not to be used or relied upon by any third party for any purpose.

DOCUMENT CONTROL SHEET

Project Number	220263
Project Name	Newcastle High School Redevelopment (NHSR)
Description	Construction Noise and Vibration Management Plan
Main Contractor	Hansen Yuncken Pty Ltd.
Key Contact	Jordan Watters

Prepared By

Company	JHA
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Phone	+61-2-9437 1000
Email	@jhaengineers.com.au
Website	www.jhaservices.com
Author	Helen Chan
Checked	Sean Matthews
Authorised	Jorge Reverter, MAAS

Revision History

Issued To	Revision and Date						
Hansen Yuncken	REV	P1	A	B			
	DATE	01/03/2024	06/03/2024	03/04/2024			
	REV						
	DATE						
	REV						
	DATE						

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1 INTRODUCTION

1.1 OVERVIEW

This Construction Noise and Vibration Management Plan (CNVMP) has been prepared by JHA Consulting Engineers on behalf of Hansen Yuncken for School Infrastructure NSW (SINSW) for the construction works associated with the Newcastle High School Redevelopment, 25A National Park Street, Newcastle West 2302.

The project involves the construction of two new buildings, alterations and additions to two existing buildings and associated landscaping works for Newcastle High School (NHS).

- New 3-storey Library, General Learning, Science and Hospitality Learning Hub – located in the SW corner of the site south of Heritage Building C
    - Ground Floor: Hospitality Trade Training, Canteen, General Learnings Spaces (Support x 7), and Library
    - Level 1: Food & Textile learning Hub (4 GLS), General Learning Hub (12 GLS)
    - Level 2: Science including 4 Labs, 8 x GLS and associated facilities
- New Multipurpose Facility – 2-storey building located in the NE corner of the site and fronting Smith Street
    - Ground Floor: Gymnasium with stage, storage, change rooms, end of trip facilities and 2 x GLS
    - Level 1: Health/PE Learning Hub - (2 x GLS, fitness lab, change) part Performing Arts Learning Hub - (2 x GLS) + practice rooms; control room and 2 additional General Learning Spaces
- Building C – No proposed works. Art, Wood, Metal & Materials Technology to remain
- Building A – refurbished existing Heritage building housing the Administration and main entry facing Parkway Avenue.
    - Ground Floor: The western end will be refurbished to create a student entry and Student support facilities
- Building K – refurbished and modified existing Heritage building located in the middle of the site.
    - Ground Floor: Existing library refurbished and converted to staff amenities
    - Level 1: No proposed works
- Building L – no proposed works
- New Sports Courts – located in the NE corner of the site and next to the new Multipurpose Facility.

Figure 1 below shows the location of the proposed new buildings plus the other buildings in the scope of works.

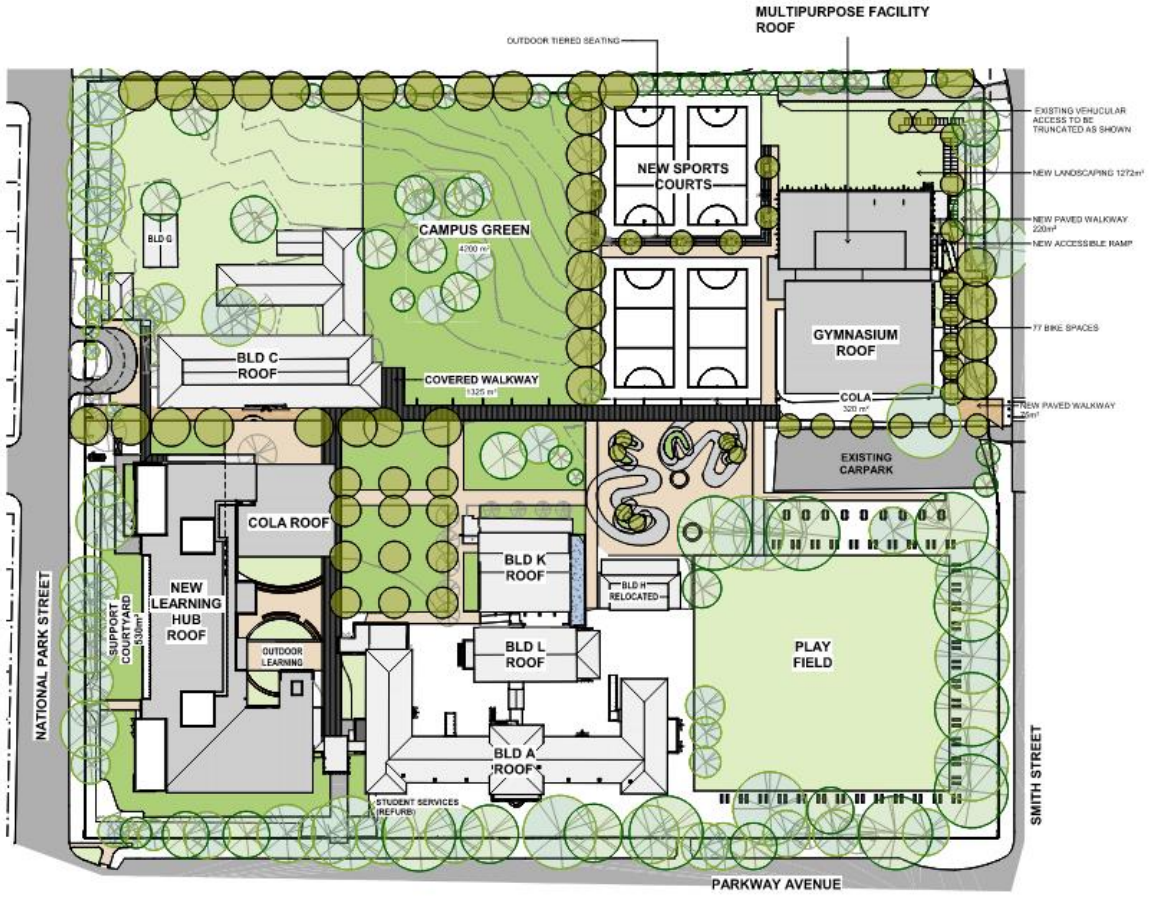

Figure 1: Site layout (Source: EJE Architecture).

This document and related work have been prepared following JHA Consulting Engineers Quality and Environmental Management Systems, which are based on AS/NZS ISO 9001:2015 and ISO 14001:2015.

1.2 PURPOSE OF THE CNVMP

The purpose of this CNVMP is to ensure that noise and vibration impacts due to Construction activities are appropriately managed in accordance with relevant legislation and standards, plus protection of the nearby sensitive receivers. The objectives of this acoustic assessment are:

- Identify noise sensitive receivers that will potentially be affected by the works.
- Determine existing ambient and background noise levels on site.
- Establish the appropriate noise level and vibration criteria in accordance with the relevant standards, guidelines and legislation.
- Determine whether the relevant criteria can be achieved based on assumed construction works and plant for the noise assessments. Where applicable, provide recommendations for any necessary acoustic control measures that will need to be incorporated into the development or use in order to ensure with the assessment criteria.
- Provide recommendations for Construction Noise and Vibration Planning.

This CNVMP identifies the Contractor's obligations and the requirements to manage noise and vibration during construction such that the necessary allowances within the construction costs, programmes and work methodologies can be made. Relevant legislation, guidelines and standards are identified in this CNVMP. All works are to be conducted as per Consent Conditions SSD-41814831. Table 1 summarize the SSD requirements and the report references.

SSD Condition number	Requirement	Report Reference for Satisfaction
B16	*The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following*	-
(a)	*Be prepared by a suitably qualified and experienced noise expert;*	*Sean Matthews is a senior acoustic engineers in JHA, Sean's CV and is eligible for membership with the AAS*
(b)	*Describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);*	*Section 4.3 and Section 7*
(c)	*Describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;*	*Section 7.1, Section 7.2*
(d)	*Include strategies that have been developed with the community for managing high noise generating works;*	*Section 7.4, Section 7.6, and Refer to Appendix C and Community Communication Strategy provided by Hansen Yuncken*
(e)	*Describe the community consultation undertaken to develop the strategies in condition B16(d)*	*Refer to Appendix C and Community Communication Strategy provided by Hansen Yuncken*
(f)	*Include a complaints management system that would be implemented for the duration of the construction; and*	*Refer to Appendix C and Community Communication Strategy provided by Hansen Yuncken*
(g)	*Include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures in accordance with the requirements of condition B13.*	*Section 7.8*

Table 1: SSD Compliance Table

1.3 NOISE AND VIBRATION ISSUES

This CNVMP addresses all works from construction works associated with the proposed development. The construction works will contribute noise and vibration emissions to the surrounding environment. Typically, this will comprise of continuous and intermittent noise and vibration from on-site construction equipment and plant equipment.

Construction noise associated with the project may include airborne and ground-borne noise impacts as follows:

- Airborne Noise: Proposed construction works will generate noise that will propagate through the air. Airborne noise generated by external construction activities is likely to impact on surrounding sensitive receivers.
- Ground-borne noise and vibration impacts: Construction and piling works have the potential to generate noise and vibration that propagates through the ground and building structural elements which is then radiated by vibrating wall and floor surfaces of nearby sensitive receivers.

1.4 RESPONSIBILITIES

The Main Contractor must be responsible for ensuring that the noise and vibration from activities carried out on site are minimised as far as practical.

The Main Contractor is responsible for:

- Ensuring that any site noise and vibration plus any complaints, are monitored, investigated, managed and controlled in accordance with the recommendations provided in this plan.
- Ensuring procurement documents specify any particular requirements in relation to the management of noise and vibration.
- Ensuring all works are undertaken in accordance with the requirements of the contract documents and this plan.
- Ensuring all project personnel and sub-contractors employed are aware of their responsibilities in regard to the management of noise and vibration during construction and assume the responsibilities assigned to them within the plan.
- Monitoring and managing noise and vibration impacts on sensitive receivers, in accordance with the requirements of the relevant guidelines and standards.
- Consulting with the occupants of surrounding buildings to inform them of the nature of the construction works, to determine any specific noise and vibration sensitivity they may have and to negotiate respite times during noisier works.

2 DESCRIPTION OF THE PROPOSAL

2.1 SITE DETAILS

Newcastle West is a suburb of Newcastle, New South Wales, located 2 kilometres west of Newcastle's central business district. The existing Newcastle High School site is located at 25A National Park Street, Newcastle West 2302 and legally known as Lot 1 DP150725, Lot 1 DP575171 & Lot 1 DP794827.

The site contains the existing Newcastle High School and is currently surrounded by low density residential receivers and public recreational areas. The surrounding land uses are as follows:

- *North*: low density residential and public recreational area.
- *East:* low density residential and public recreational area.
- *South:* low density residential.
- *West:* low density residential.

Figure 2 shows the site boundary of the NEC site.

Figure 2: Newcastle High School site boundary (orange shading).

2.2 NOISE SENSITIVE RECEIVER DETAILS

A summary of the nearest noise sensitive receivers surrounding the site is shown in Table 2 and Figure 3, including assumed approximate distances from the buildings with noise sources to the receiver boundaries, noting the type of noise receiver and if the receiver is existing or future.

ID	*Sensitive Receiver*	*Receiver Status*	*Receiver Type*	*Approx. Distance, m*
1	60 - 80 National Park Street	Existing	Residential	30
2	82 - 94 National Park Street	Existing	Residential	50
3	27 - 37 National Park Street 167 – 189 Parkway Avenue	Existing	Residential	30
4	1 - 9 Smith Street	Existing	Residential	60
5	3 - 17 Dumaresq Street 140 – 158 Parkway Avenue	Existing	Residential	40
6	Corner of Parry & Smith Street	Existing	Active recreation	20
7	53 Parry Street	Existing	Active recreation	20

Table 2: Nearest sensitive receivers surrounding the site.

Figure 3: Nearest noise sensitive receivers surrounding the site location.

It is noted that if noise impacts associated with the proposed development are controlled at the nearest noise-sensitive receivers (as identified above) then compliance with the recommended criteria at all noise-sensitive receivers will be achieved. The nearest residential receiver will be used for assessment purposes for the residential and public recreation catchments.

3 SITE MEASUREMENTS

Attended and unattended noise surveys were conducted at the locations shown in Figure 4 to establish the ambient and background noise levels of the site. Noise surveys were carried out in accordance with Australian Standard AS/NZS 1055:2018. The noise survey locations were selected as they are representative of the noise levels at the nearby affected noise sensitive receivers. The noise surveys have been used to establish the noise assessment level criteria for the proposed development.

Figure 4: Noise survey locations and boundary of the site.

From observations during the noise survey, it is noted that ambient noise levels are dominated by vehicular movement on Parkway Avenue and infrequent vehicular movement on National Park Street and Smith Street. Low pedestrian activity was also observed.

The noise monitoring locations were selected based on all surrounding locations of residential receivers, therefore the monitoring has comprehensively captured the background noise levels at all receivers, including the lowest background levels in order to take the more conservative approach.

3.1 SHORT-TERM NOISE MONITORING

Short-term noise monitoring was carried out to obtain representative third-octave band noise levels of the site on Tuesday 29th November and Thursday 8th December 2022, during the day-time period. Short-term noise measurements were carried out with a NTi XL-2 hand-held Sound Level Meter (SLM) (Serial Number A2A-13742-E0). The calibration of the SLM was checked before and after each use, and no deviations were recorded.

The SLM microphone was mounted 1.5 metres above the ground, and a windshield was used to protect the microphone. Measurements were undertaken in the free field – i.e., more than 3 metres away from any building façade or vertical reflective surface. Weather conditions were calm and dry during the attended noise monitoring.

A summary of the results of the short-term noise monitoring is shown in Table 3.

Location	*Date and Time*	*Parameter*	*Sound Pressure Level, dB (re 20µPa)*								
			Overall dB(A)	*Octave Band Centre Frequency, Hz*							
				63	*125*	*250*	*500*	*1k*	*2k*	*4k*	*8k*
M1	29/11/2022 12:12pm – 12:27pm	$L_{90,15min}$	**53**	57	53	49	45	47	45	39	32
		$L_{eq,15min}$	**63**	69	65	60	58	59	55	51	44
		$L_{10,15min}$	**67**	71	66	63	61	62	59	54	47
M2	08/12/2022 12:10pm – 12:25pm	$L_{90,15min}$	**53**	56	53	49	46	48	45	39	30
		$L_{eq,15min}$	**64**	70	72	66	59	58	56	50	42
		$L_{10,15min}$	**65**	70	67	62	59	60	57	51	44

Table 3: Results of short-term noise monitoring.

3.2 LONG-TERM NOISE MONITORING

Long-term noise monitoring was carried out from Tuesday 29th November to Thursday 8th December 2022 with Rion NL-52 noise loggers (Serial Numbers: 175549, 01254316, and 553892). The noise loggers recorded L_{A1}, L_{A10}, L_{Aeq} and L_{A90} noise parameters at 15-minute intervals during the measurement period. The calibration of the noise loggers was checked before and after use and no deviations were recorded.

The noise logger locations are shown in Figure 4. The locations were secured and are considered to be representative of the typical ambient and background noise levels. The noise logger microphones were mounted 1.5 metres above the ground and windshields were used to protect the microphones. Weather conditions were monitored during the unattended noise monitoring period and generally were calm and dry during the unattended monitoring.

The detailed results of the long-term noise monitoring are presented graphically in Appendix A. As stated in the NSW EPA Noise Policy for Industry (NPI) 2017, any data likely to be affected by rain, wind or other extraneous noise has been excluded from the calculations (shadowed in the Appendix A graphs).

The Rating Background Levels (RBLs) have been established in general accordance with the methodology described in the NSW NPI – i.e., 10th percentile background noise level (L_{A90}) for each period of each day of the ambient noise level. The median of these levels is then presented as the RBL for each assessment period.

These RBLs are shown in Table 4, together with the ambient noise levels (L_{Aeq}) measured for each period.

Location	*Rating Background Levels, dB(A)*			*Ambient Noise Levels, dB(A)*		
	Day 7am-6pm	*Evening 6pm-10pm*	*Night 10pm-7am*	*Day 7am-6pm*	*Evening 6pm-10pm*	*Night 10pm-7am*
L1	44	37	30	58	57	51
L2	45	41	33	59	55	50

Table 4: Results of long-term noise monitoring.

4 NOISE AND VIBRATION CRITERIA

4.1 RELEVANT CODES AND STANDARDS

In preparing this CNVMP, the following documentation including legislation, codes, standards and guidelines have been considered:

- Regulatory Framework:
  - Environmental Planning and Assessment (EP&A) Act 1979.
  - Protection of the Environmental Operations (POEO) Act 1997.
- Construction Noise and Vibration:
  - NSW Department of Environment and Climate Change (DECC) *'Interim Construction Noise Guideline'* (ICNG) 2009.
  - NSW DECC Assessing Vibration: A Technical Guideline 2006.
  - NSW Transport Roads & Maritime Services (RMS) *'Construction Noise and Vibration Guideline'* 2016.
  - Australian Standard AS 2436:2010 *'Acoustics – Guide to Noise Control on Construction, Maintenance & Demolition Sites'*.
  - British Standards Institution BS 6472:2008 *'Evaluation of human exposure to vibration in buildings (1 to 80 Hz)'*.
  - British Standards Institution BS 7385.2:1993 *'Evaluation and Measurement for Vibration in Buildings. Guide to Damage Levels from Ground-borne Vibration'*.
  - Noise and Vibration Impact Assessment for State Significant Development Application [Rev. C] prepared by JHA.
  - Acoustics Schematic Design Report [Rev.E] prepared by JHA.

4.2 REGULATORY FRAMEWORK

4.2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT (EP&A) ACT 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) provides the regulatory framework for the protection of the environment in NSW. The EP&A Act is relevantly about planning matters and ensuring that "environmental impact" associated with the proposed development is properly considered and reasonable before granting development consent to develop.

The assessment of "environmental impact" relies upon the identification of acceptable noise criteria which may be defined in a Development Control Plan, or derived from principles using guidelines like NSW EPA Noise Policy for Industry (NPI 2017) or Noise Guide for Local Government (NGLG 2013).

4.2.2 PROTECTION OF THE ENVIRONMENTAL OPERATIONS (POEO) ACT 1997

The Protection of the Environment Operations (POEO) Act 1997 has the objective to protect, restore and enhance the quality of the NSW environment. Abatement of noise pollution is underpinned by the definition of *"offensive noise"* as follows:

"...

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.

..."

Noise Guide for Local Government (NGLG) 2013, provides a consideration checklist to determine an *"offensive noise"*.

4.3 NSW INTERIM CONSTRUCTION NOISE GUIDELINE

The noise criteria in this section are for guidance only and do not form part of any legal obligation on the part of the project proponent. However, compliance with these criteria is considered best practice.

The ICNG suggest construction noise management levels that may minimise the likelihood of annoyance being caused to noise sensitive residential receivers depending on the duration of works. The Noise Management Levels (NMLs) for long-term duration works are as follows for residential receivers:

Time of Day	*NML $L_{Aeq,15min}$*	*How to Apply*
ICNG Criteria for Recommended Standard Hours: Mon-Fri 7am-6pm Sat 8am-1pm No work on Sundays or public holidays	Noise affected: RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. ▪ Where predicted or measured $L_{Aeq,15min}$ is greater that the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. ▪ The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected: 75dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. ▪ Where noise is above this level, the relevant authority may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise. 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Time of Day	*NML $L_{Aeq,15min}$*	*How to Apply*
ICNG Criteria for Outside Recommended Standard Hours *Refer to approved hours from the Consent Conditions*	Noise affected: RBL + 5dB	▪ A strong justification would typically be required for work outside the recommended standard hours. ▪ The proponent should apply all feasible and reasonable work practices to meet the noise affected level. ▪ Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community.

Table 5: ICNG construction airborne noise criteria for residential receivers surrounding the construction site.

In order to establish the airborne construction noise criteria, noise levels from the unattended noise monitoring have been used for the noise sensitive receivers – refer to Section 3. Table 6 below summarises the airborne construction noise criteria for most affected noise sensitive receivers surrounding the development site.

Sensitive Receiver		*Airborne Construction Noise Criteria, L_{Aeq} dB(A)*	
		Within Standard Hours	*Outside Standard Hours*
Residential Receivers	Noise affected / External	55	50
	Highly noise affected / External	75	-
Active Recreation	External	65	-
Existing Classrooms	Internal	45	-

Table 6: ICNG construction airborne noise criteria for noise sensitive receivers surrounding the site.

Note that for rooms with open windows, the external noise criteria for existing classrooms can be 10dB higher than the internal noise criteria.

The ICNG recommends internal ground-borne noise maximum levels at residences affected by nearby construction activities. Ground-borne noise is noise generated by vibration transmitted through the ground into a structure and can be more noticeable than airborne noise for some sensitive receivers. The ground-borne noise levels presented below from the ICNG are for residential receivers during evening and night-time periods only, as the objective is to protect the amenity and sleep of people when they are at home.

- Evening: $L_{Aeq,15min}$ 40dB(A) (internal)
- Night: $L_{Aeq,15min}$ 35dB(A) (internal)

The internal noise levels are assessed at the centre of the most affected habitable room. No assessments of ground borne noise are has been conducted as no out of hours work is proposed to occur during evening time and night time.

4.4 VIBRATION CRITERIA

There are two items that shall be considered in the assessment of vibration impacts from construction works. These include vibration impacts in terms of human comfort and building damage.

4.4.1 HUMAN COMFORT

The Department of Environment and Climate Change (DECC) developed the document *'Assessing Vibration: A Technical Guideline'* in February 2006 to assist in preventing people from exposure to excessive vibration levels within buildings. It is based on the guidelines contained in BS 6472.1:2008 *'Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting'*. The guideline does not however address vibration induced damage to structures or structure-borne noise effects.

Vibration and its associated effects are usually classified as follows:

- *Continuous vibration*. An uninterrupted vibration for a defined period. This type of vibration is assessed on the basis of weighted root-mean-squared (rms) acceleration values.
- *Impulsive vibration*. A vibration which has a rapid build up to a peak followed by a damped decay that may or may not involve several cycles of vibration (depending on the frequency and damping).
- *Intermittent vibration*. An interrupted periodic vibration of continuous or repeated periods of impulsive vibration, or continuous vibration that varies significantly in amplitude. This type of vibration is assessed on the basis of Vibration Dose Values (VDV).

Vibration criteria for continuous and impulsive vibration are presented in Table 7, in terms of vibration velocity levels. The values are assessed for the most critical frequency range (higher than 8 Hz assuming sinusoidal motion). When assessing intermittent vibration comprising a number of events, it is recommended that the Vibration Dose Value (VDV) is used Table 8 shows the acceptable VDV values for intermittent vibration.

Receiver Type	*Time*	*RMS velocity, mm/s [dB ref 10^{-6}mm/s]*			
		Continuous Vibration		*Impulsive Vibration*	
		Preferred	*Maximum*	*Preferred*	*Maximum*
Residences	Day-time	0.20 [106 dB]	0.40 [112 dB]	6.00 [136 dB]	12.00 [142 dB]
	Night-time	0.14 [103 dB]	0.28 [109 dB]	2.00 [126 dB]	4.00 [132 dB]
Offices, schools, educational and worship	When in use	0.40 [112 dB]	0.80 [118dB]	13.00 [142dB]	26.00 [148 dB]

Table 7: Continuous and impulsive vibration criteria applicable to the site. Note: Day-time is 07:00am to 10:00pm and night-time is 10:00pm to 07:00am.

Place	*Time*	*Vibration Dose Values, $m/s^{1.75}$*	
		Preferred	*Maximum*
Residences	Day-time	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational and worship	When in use	0.40	0.80

Table 8: Intermittent vibration criteria applicable to the site.

4.4.2 STRUCTURAL BUILDING DAMAGE

4.4.2.1 Structural Building Damage

Ground vibration from construction activities can damage surrounding buildings or structures. For occupied buildings, the vibration criteria given in the previous section for Human Comfort shall generally for the limiting criteria for the Project.

For unoccupied buildings, or during periods where the buildings are unoccupied, the vibration criteria for building damage suggested by German Standard DIN 4150.3:2016 *'Structural Vibration – Effects of Vibration on Structures'* and British Standard BS 7385.2:1993 *'Evaluation and Measurement for Vibration in Buildings'* are to be adopted. Guideline values from DIN 4150.3:2016 and BS 7385.2:1993 are presented in Table 9 and Table 10 respectively.

Structural type	*Vibration velocity, mm/s (Peak Particle Velocity – PPV)*				
	Foundation			*Plane of floor uppermost full storey*	*Floor slabs, vertical direction*
	Less than 10Hz	*10 to 50Hz*	*50 to 100Hz*	*All frequencies*	*All frequencies*
Type 1: Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40	20
Type 2: Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
Type 3: Structures that because their particular sensitivity to vibration, cannot be classified under Type 1 and 2 and are of great intrinsic value (e.g. heritage buildings)	3	3 to 8	8 to 10	8	20

Table 9: DIN 4150.3:2016 Guideline values of vibration velocity for evaluating the effects of short-term vibration.

Structural type	*Peak particle velocity, mm/s*	
	4 to 15Hz	*15Hz and above*
Unreinforced or light framed structures Residential or light commercial type buildings	15mm/s @ 4Hz increasing to 20mm/s @ 15Hz	20mm/s @ 15Hz increasing to 50mm/s @ 40Hz and above

Table 10: BS 7385.2:1993 Guideline values of vibration velocity for evaluating cosmetic damage.

5 CONSTRUCTION ACTIVITIES

Hansen Yuncken has been engaged as the main Contractor for the proposed works. A construction noise and vibration assessment has been carried out based on information supplied by the Contractor which includes construction phases and construction plant associated with the works. The Contractor will be responsible for preparing a Construction Works Plan and Schedule which include all relevant noise and vibration information.

5.1 DESCRIPTION OF WORKS

The stages of work as provided by the Contractor that have been assessed, and which construction activities will occur during those stages are detailed in the flowing table.

Stage	*Duration*	*Phase*	*Activities*	*Plant*
1	13 weeks	*Demolition*	Removal of trees, landscape, Building B and Sports courts	Manitou, excavator, mobile crane
		Civil	Relocate Building H	Flatbed trucks, cranes
		Internal	Services infrastructure upgrades	Trucks, EWP
2 & 3	47 weeks	*Demolition*	Removal of Building P	Manitou, excavator, mobile crane
		Civil	Construction of new Learning Hub, Multipurpose Facility, Excavation, trenching, backfilling	Excavators, trucks and dog, manitou, roller
		Structure	Formwork, reinforcement fix, concrete place, structural steel	Concrete boom trucks, concrete pump, manitou. mobile crane
		Internal plus Façade	Cladding, framing, sheeting, services rough in, fit off, floor coverings, scaffolding	EWP, boom lift, trucks. manitou, mobile crane
		External	landscaping, walkways, external works with Multipurpose Facility and Learning Hub	Trucks, manitou, mobile crane
4	14 weeks	*Demolition*	Removal of Building J and walkway	Manitou, excavator, mobile crane
		Internal	Refurbish Building A and K	EWP, boom lift, trucks, manitou, mobile crane
		External	Landscaping and site works	Trucks, manitou, mobile crane
5	16 weeks	*Demolition*	Removal of Building D, E, I	Manitou, excavator, mobile crane
		Civil	Construction of new Sports Courts, Excavation, trenching, backfilling, concrete place	Excavators, trucks and dog, manitou, roller, concrete pump, concrete boom trucks
		External	landscaping, walkways	Trucks, manitou, mobile crane

Table 11: Anticipated maximum airborne noise levels for construction plant used during the different stages of the works.

5.2 PROPOSED CONSTRUCTION WORKING HOURS

The proposed construction hours as per the Consent Conditions are 7am to 6pm, Mondays to Fridays inclusive; and 8am to 1pm on Saturdays. The proposed restricted hours of work, provided that noise levels do not exceed the existing background noise level plus 5dB, are 6pm to 7pm, Mondays to Fridays inclusive, and 1pm to 4pm on Saturdays as per the consent conditions.

5.3 TYPICAL EQUIPMENT AND NOISE LEVELS

In accordance with the information provided and to assess the potential noise and vibration impacts during works from a quantitative point of view, the construction noise sources for the works occurring during the project and the associated equipment noise levels are listed in Table 12.

Sound power levels are based on the databases published by Australian Standard 2436:2010 *'Guide to Noise Control on Construction, Maintenance & Demolition Sites'*, Roads and Maritime Services '*Construction Noise and Vibration Guideline'* and the UK Department for Environmental, Food and Rural Affairs (DEFRA).

Stage of works	*Item*	*Typical Sound Power Level L_{WAeq} (dB ref 1pW)*	*Typical Sound Pressure Level L_{Aeq} at 10m (dB ref 20μPa)*
Demolition	Excavator with breaker	116	88
	Manitou	111	83
	Mobile crane	101	73
Civil	Excavator with bucket	104	76
	Truck and dog	105	77
	Manitou	111	83
	Roller	105	77
Structure	Concrete Pump	105	77
	Manitou	111	83
	Mobile crane	101	73
	Concrete Truck	109	81
Internal plus Façade	Truck	105	77
	EWP	102	74
	Boom Lift	102	74
	Manitou	111	83
	Mobile crane	101	73
External	Truck	105	77
	Manitou	111	83
	Mobile crane	101	73

Table 12: Anticipated maximum airborne noise levels for construction plant used during the different stages of the works.

6 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

A construction noise and vibration assessment has been carried out based on the proposed plant and machinery throughout the works associated with the stages as per Section 5.

6.1 ASSESSMENT METHODOLOGY

An assessment of the likely noise and vibration impacts of the assumed stage of works on the most affected receivers surrounding the site has been carried out. The assessment has considered the following:

- Construction activities considered in the noise impact are detailed in Section 5.1.
- Proposed construction hours as per Section 5.2.
- Typical noise source levels considered in the noise impact are detailed in Section 5.3.
- Project specific noise and vibration criteria at sensitive receivers as outlined in Section 3.1.

Figure 5: Stage 1 – Indicative site plan with site boundary plus works area highlighted.

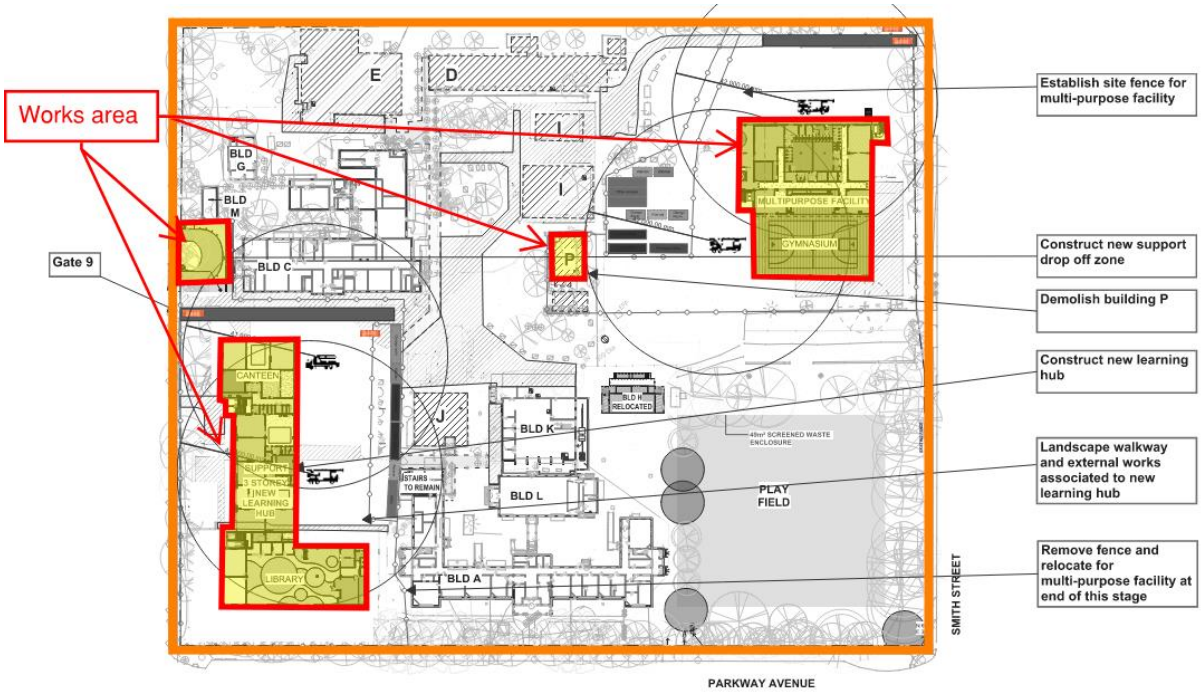

Figure 6: Stage 2&3 - Indicative site plan with site boundary plus works area highlighted.

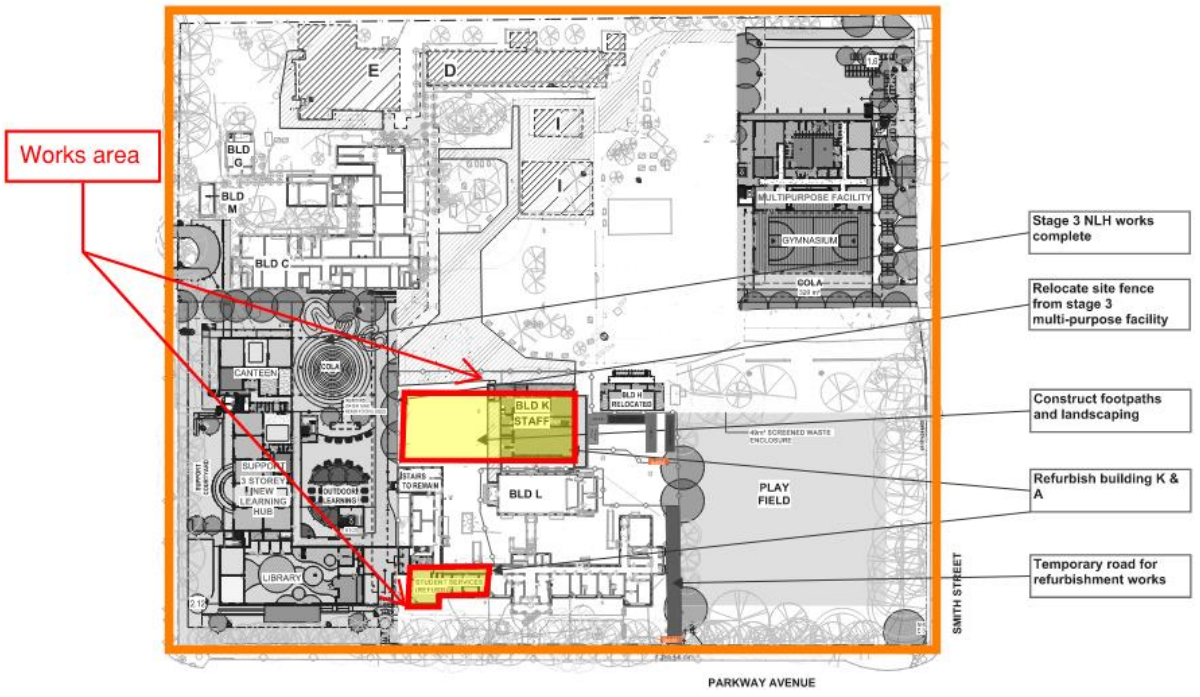

Figure 7: Stage 4 - Indicative site plan with site boundary plus works area highlighted.

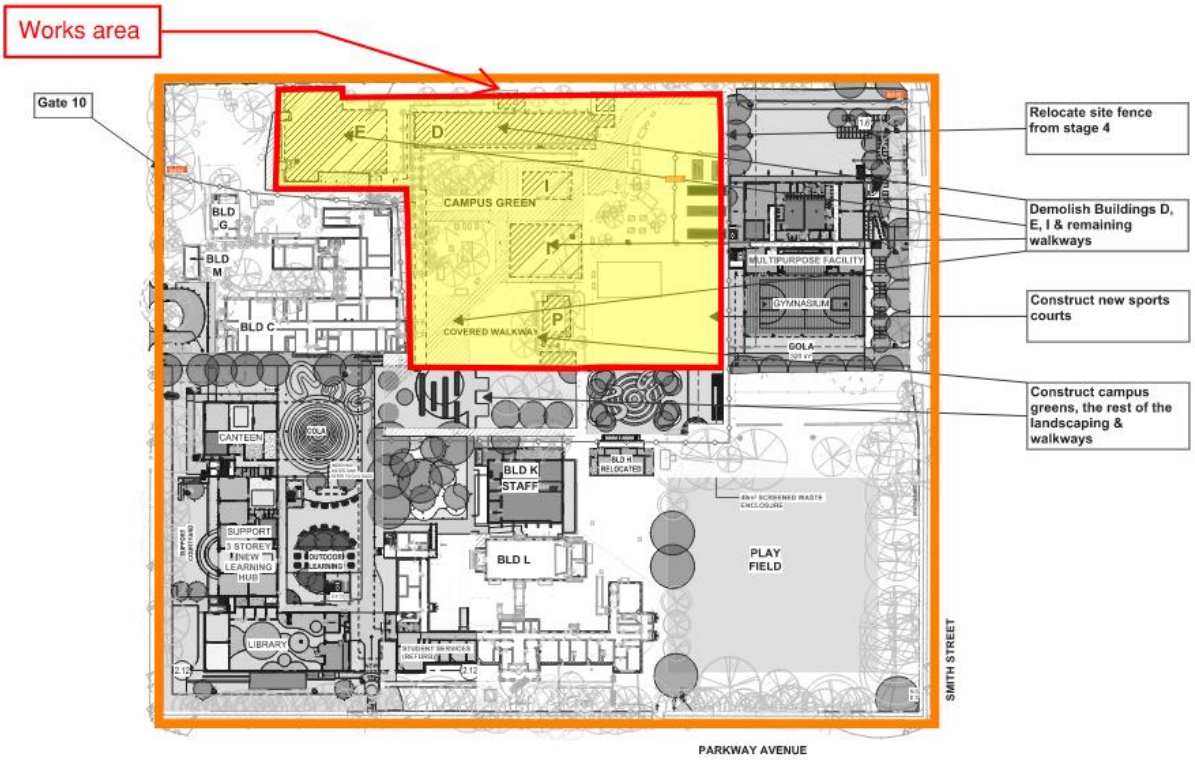

Figure 8: Stage 5 - Indicative site plan with site boundary plus works area highlighted.

The predicted noise levels at the surrounding sensitive receivers have been based on the assumptions and aforementioned sound power levels of the equipment. The results of the predicted noise levels are presented in the following Sections.

It should be noted that the predicted noise levels generated during the construction works may vary depending on many factors including:

- Final selection of plant and equipment which could differ from the plant presented in Table 12.
- Exact location of equipment and plant on site – relative to the noise sensitive receivers.
- Reflections provided by existing structures on and around the site.

6.2 NOISE ASSESSMENT

The predicted noise levels for the stages of work detailed in Table 12 are presented in the following Sections. These predicted noise levels are typically representative of the worst case 15 minutes that would be expected. The predicted noise levels at receiver locations are calculated to 1.5m above ground level, at the most affected point externally to each receiver that has been identified as the most affected.

The ICNG requires, and it is usual practice, to predict the reasonable worst-case noise level. For construction-type activities this will typically be when plant is operating close to an assessment location. However, it shall be considered that on larger construction sites (such as this one) where plant moves around, noise will not be at the reasonable worst-case noise level throughout the entire duration of the activity: it will be lower when the plant is further away. Therefore, it can be stated that noise levels will be lower at times throughout the construction activity.

6.2.1 STAGE 1

This section presents the results for the components of work for Stage 1.

6.2.1.1 Demolition

Table 13 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed demolition works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
Excavator with breaker	116	71	68	69	57	57	57	62
Manitou	111	66	63	64	52	52	52	57
Mobile Crane	101	56	53	54	42	42	42	47
Total		72	69	71	59	59	59	64

Table 13: Predicted airborne noise levels for the proposed demolition at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results show that predicted construction noise levels are expected to exceed the NMLs (orange text) for NCA's 1, 2, 3, 4 and 5 during operation of all machinery and equipment in proximity of the boundaries close to the receivers. The predicted exceedance of the NMLs in the surrounding receivers will trigger the contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Demolition phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 72dB(A) and 79dB(A) at the façade of Building A, C, M, K, G and L during the Demolition stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.1.2 Civil

Table 14 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed civil works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
Excavator	104	59	56	57	48	51	53	56
Truck	105	60	57	58	49	52	54	57
Manitou	111	66	63	64	55	58	60	63
Roller	105	60	57	58	49	52	54	57
Total		69	65	67	57	61	62	65

Table 14: Predicted airborne noise levels for the proposed civil works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results show that predicted construction noise levels at residential receivers are expected to exceed (orange text) up to 14dB whilst all plant is operational concurrently. These expected exceedances of the NMLs in the surrounding receivers will trigger the Contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Civil phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 69dB(A) and 75dB(A) at the façade of Building A, C, M, K and L during the Civil stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.1.3 Internal

Table 15 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed façade works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
EWP	102	45	43	48	46	49	46	46
Truck	105	48	46	51	49	52	49	49
Manitou	111	54	52	57	55	58	55	55
Mobile Crane	101	44	42	47	45	48	45	45
Boom lift	102	45	43	48	46	49	46	46
Total		56	54	59	57	60	57	57

Table 15: Predicted airborne noise levels for the proposed internal works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results indicate that all residential receivers, except NCA 2, are expected to exceed (orange text) standard hours NMLs. These expected exceedances of the NMLs in the surrounding receivers will trigger the Contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Internal plus Façade phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 68dB(A) and 74dB(A) at the façade of Building A, C, K and L during the Internal plus Façade stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.2 STAGE 2 & 3

This section presents the results for the components of work for Stage 2 & 3.

6.2.2.1 Demolition

Table 16 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed demolition works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
Excavator with breaker	116	65	59	65	63	66	60	63
Manitou	111	55	51	55	52	56	55	58
Mobile Crane	101	45	41	45	42	46	45	48
Total		66	63	67	64	67	62	65

Table 16: Predicted airborne noise levels for the proposed demolition at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results show that predicted construction noise levels are expected to exceed the NMLs (orange text) for NCA's 1, 2, 3, 4 and 5 during operation of all machinery and equipment in proximity of the boundaries close to the receivers. The predicted exceedance of the NMLs in the surrounding receivers will trigger the contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Demolition phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 72dB(A) and 79dB(A) at the façade of Building A, C, K, and L during the Demolition stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.2.2 Civil

Table 17 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed civil works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
Excavator	104	59	54	57	45	53	59	58
Truck	105	60	55	58	46	54	60	59
Manitou	111	66	61	64	52	60	66	65
Roller	105	60	55	58	46	54	60	59
Total		69	64	67	55	62	69	67

Table 17: Predicted airborne noise levels for the proposed excavation and piling works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results show that predicted construction noise levels are expected to exceed (orange text) up to 14dB whilst all plant is operational concurrently. These expected exceedances of the NMLs in the surrounding receivers will trigger the Contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Civil phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 69dB(A) and 75dB(A) at the façade of Building A, C, M, K and L during the Civil stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.2.3 Structure

Table 18 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed structure works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
Concrete Pump	*105*	60	55	58	46	54	60	59
Manitou	*111*	66	61	64	52	60	66	65
Mobile crane	*101*	56	51	54	42	50	56	55
Concrete Truck	*109*	64	59	62	50	58	64	63
Total		69	64	67	55	63	69	68

Table 18: Predicted airborne noise levels for the proposed structure works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Predicted noise levels are expected to exceed (orange text) at all receivers except NCA 4, with exceedances up to 14dB. These expected exceedances of the NMLs in the surrounding receivers will trigger the Contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Structure phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 69dB(A) and 75dB(A) at the façade of Building A, C, K and L during the Structure stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.2.4 Internal plus Façade

Table 19 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed façade works. Allowances have been made for distance attenuation, shielding and reflections.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)						
		Residential Receivers					Other Receivers	
		ID 1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7
EWP	102	57	52	55	43	51	57	56
Truck	105	60	57	58	46	54	60	59
Manitou	111	66	63	64	52	60	66	65
Mobile Crane	101	56	53	54	42	50	56	55
Boom lift	102	57	54	55	43	49	55	56
Total		68	65	66	54	62	68	67

Table 19: Predicted airborne noise levels for the proposed façade works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results indicate that all residential receivers, except NCA 4, are expected to exceed (orange text) standard hours NMLs. These expected exceedances of the NMLs in the surrounding receivers will trigger the Contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Internal plus Façade phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 68dB(A) and 74dB(A) at the façade of Building A, C, K and L during the Internal plus Façade stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.2.5 External

Table 20 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed landscaping works. Allowances have been made for distance attenuation, shielding and reflections.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)						
		Residential Receivers					Other Receivers	
		ID 1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7
Truck	105	60	55	58	46	54	60	59
Manitou	111	66	61	64	52	60	66	65
Mobile Crane	101	56	51	54	42	50	56	55
Total		68	63	66	54	61	68	66

Table 20: Predicted airborne noise levels for the proposed landscaping works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results indicate that all residential receivers except receivers within NCA 4 are expected to exceed (orange text) standard hours NMLs when works will be carried out in proximity of the boundaries close to the receivers. The predicted exceedance of the NMLs in the surrounding receivers will trigger the contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the External phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 68dB(A) and 74dB(A) at the façade of Building A, C, K and L during the External stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.3 STAGE 4

This section presents the results for the components of work for Stage 4.

6.2.3.1 Demolition

Table 21 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed demolition works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
Excavator with breaker	116	64	61	64	57	59	58	59
Manitou	111	59	56	59	52	54	53	54
Mobile Crane	101	49	46	49	42	44	43	44
Total		65	62	65	59	60	59	60

Table 21: Predicted airborne noise levels for the proposed demolition at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results show that predicted construction noise levels are expected to exceed the NMLs (orange text) for NCA's 1, 2, 3, 4 and 5 during operation of all machinery and equipment in proximity of the boundaries close to the receivers. The predicted exceedance of the NMLs in the surrounding receivers will trigger the contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Demolition phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 72dB(A) and 85dB(A) at the façade of Building C and L during the Demolition stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.3.2 Internal plus Façade

Table 22 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed façade works. Allowances have been made for distance attenuation, shielding and reflections.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)						
		Residential Receivers					Other Receivers	
		ID 1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7
EWP	102	50	47	50	43	45	44	45
Truck	105	53	50	53	46	48	47	48
Manitou	111	59	56	59	52	54	53	54
Mobile Crane	101	49	46	49	42	44	43	44
Boom lift	102	50	47	50	43	45	44	45
Total		61	58	61	54	56	55	56

Table 22: Predicted airborne noise levels for the proposed façade works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results indicate that all residential receivers, except NCA 4, are expected to exceed (orange text) standard hours NMLs. These expected exceedances of the NMLs in the surrounding receivers will trigger the Contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Internal plus Façade phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 68dB(A) and 80dB(A) at the façade of Building A, C, K and L during the Internal plus Façade stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.3.3 External

Table 23 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed landscaping works. Allowances have been made for distance attenuation, shielding and reflections.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)						
		Residential Receivers					Other Receivers	
		ID 1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7
Truck	105	53	50	53	46	48	47	48
Manitou	111	59	56	59	52	54	53	54
Mobile Crane	101	49	46	49	42	44	43	44
Total		60	57	60	54	55	54	55

Table 23: Predicted airborne noise levels for the proposed landscaping works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results indicate that the residential receivers NCA 1, 2, 3 are expected to exceed (orange text) standard hours NMLs when works will be carried out in proximity of the boundaries close to the receivers. The predicted exceedance of the NMLs in the surrounding receivers will trigger the contractor to apply reasonable and

feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the External phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 68dB(A) and 80dB(A) at the façade of Building K and L during the External stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.4 STAGE 5

This section presents the results for the components of work for Stage 5.

6.2.4.1 Demolition

Table 24 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed demolition works. Allowances have been made for distance attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*						
		Residential Receivers					*Other Receivers*	
		ID 1	*ID 2*	*ID 3*	*ID 4*	*ID 5*	*ID 6*	*ID 7*
Excavator with breaker	116	68	57	59	57	60	61	77
Manitou	111	63	52	54	52	55	56	72
Mobile Crane	101	53	42	44	42	45	46	62
Total		69	58	60	59	62	62	79

Table 24: Predicted airborne noise levels for the proposed demolition at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results show that predicted construction noise levels are expected to exceed the NMLs (orange text) for NCA's 1, 2, 3, 4, 5 and 7 during operation of all machinery and equipment in proximity of the boundaries close to the receivers. The predicted exceedance of the NMLs in the surrounding receivers will trigger the contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Demolition phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 72dB(A) and 79dB(A) at the façade of Building C and L during the Demolition stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.4.2 Civil

Table 25 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed civil works. Allowances have been made for distance attenuation, shielding and reflections.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)						
		Residential Receivers					Other Receivers	
		ID 1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7
Excavator	104	52	45	47	46	50	52	65
Truck	105	53	46	48	47	51	53	66
Manitou	111	59	52	54	53	57	59	72
Roller	105	53	46	48	47	51	53	66
Total		61	54	56	55	60	61	75

Table 25: Predicted airborne noise levels for the proposed excavation and piling works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results show that predicted construction noise levels are expected to exceed (orange text) up to 6dB whilst all plant is operational concurrently. These expected exceedances of the NMLs in the surrounding receivers will trigger the Contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the Civil phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 69dB(A) and 75dB(A) at the façade of Building A, C, M, K and L during the Civil stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.2.4.3 External

Table 26 shows the predicted sound pressure levels at the boundary of the nearest NCA's due to the construction plant for the proposed landscaping works. Allowances have been made for distance attenuation, shielding and reflections.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)						
		Residential Receivers					Other Receivers	
		ID 1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7
Truck	105	53	46	48	47	51	53	66
Manitou	111	59	52	54	53	57	59	72
Mobile Crane	101	49	42	44	43	47	49	62
Total		60	53	55	54	59	60	74

Table 26: Predicted airborne noise levels for the proposed landscaping works at the nearest noise receivers. Exceedances to criteria (refer to Table 6) indicated in orange and highly noise affected residential criteria in red text.

Results indicate that the residential receivers NCA 1 and 5 are expected to exceed (orange text) standard hours NMLs when works will be carried out in proximity of the boundaries close to the receivers. The predicted exceedance of the NMLs in the surrounding receivers will trigger the contractor to apply reasonable and feasible work practices to minimise the noise as much as possible, as per the requirements of the ICNG. Refer to Section 7 for details.

Noise from works associated with the External phase of works are expected to impact existing school receivers. Worst case noise impacts are predicted to range between 68dB(A) and 74dB(A) at the façade of Building K and L during the External stage of works. It is recommended to keep windows shut when there are high noise generating works occurring outside.

6.3 VIBRATION ASSESSMENT

The vibration intensive plant used during the construction works may impact on adjacent sensitive receivers. In order to assess the construction vibration impact due to heavy construction plant, the NSW RMS *'Construction Noise and Vibration Guideline'* provides safe working distances for vibration intensive plant and are quoted for both 'cosmetic' damage (in accordance with BS 7385.2:1993) and human comfort (in accordance with DEC's *'Assessing Vibration: A Technical Guideline'*). The recommended safe working distances are provided in Table 27.

Plant Item	*Description*	*Cosmetic Damage*	*Human Response*
Vibratory Roller	200 kN (Typically 4-6 tonnes)	12m	40m
	300 kN (Typically 7-13 tonnes)	15m	100m
Medium Hydraulic Hammer	12–18 t excavator	7m	23m
Large Hydraulic Hammer	18-34 t excavator	22m	73m

Table 27: Recommended minimum working distances for vibration intensive plant from sensitive receivers.

The minimum working distances are indicative and will vary depending on the particular item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions. The construction methods are to be reviewed to ensure the safe working distances are achieved.

All work, particularly piling, is to be conducted in accordance with the safe working distances. Where sheet piling is within 20m of a building, screw piling should be considered, and attended vibration measurements conducted in order to verify levels.

In relation to human comfort (response), the minimum working distances in Table 27 relate to intermittent vibration (VDV parameter) as for most construction activities, vibration emissions are intermittent in nature. Where the predicted vibration levels will exceed the human comfort objectives, the procedures in Section 7.2.2 are to be followed in order to mitigate the potential impacts at sensitive receivers.

If the contractor has concerns for the disruptions at the nearest sensitive receivers due to vibration intensive plant use, it is recommended that prior to the commencement of the works, to undertake a preliminary vibration survey on each key vibration generating activity / equipment.

7 NOISE AND VIBRATION CONTROL RECOMMENDATIONS

This section of the Construction Noise and Vibration Planning provides general recommendations only and provides applicable criteria together with best noise and vibration control practices to be observed during the proposed works.

Any noise from construction activities to be carried out on site must not result in *'offensive noise'* to any noise sensitive receiver. To this end, the Contractor employed to undertake the construction works is responsible for ensuring that any site noise and, in particular, any complaints shall be monitored, investigated, managed and controlled.

7.1 RESPITE PERIODS

Respite periods should be provided and should generally be implemented into the work methodology in order to reduce the impact onto the surrounding NCA's, as detailed in Section 7.6. High noise generating activities such as rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

- 9:00am to 12:00pm, Monday to Friday;
- 2:00pm to 5:00pm Monday to Friday; and
- 9:00am to 12:00pm, Saturday.
- Rock breaking, excavation and piling should not occur for more than 3 hours continuously, with at least a 1 hour respite period in between.

7.2 GENERAL CONTROLS FOR NOISE AND VIBRATION

According to ICNG and AS2436:2010 *'Guide to Noise Control on Construction, Maintenance & Demolition Sites'*, the following techniques could be applied to minimize the spread of noise and vibration to the nearest sensitive receivers.

7.2.1 NOISE

If a process that generates significant noise levels cannot be avoided, the amount of noise reaching the receiver should be minimized. Two ways of achieving this are to either increase the distance between the noise source and the receiver or to introduce noise reduction measures such as acoustic barriers/screens.

Physical methods to reduce the transmission of noise between the site works and residences, or other sensitive land uses, are generally suited to works where there is longer-term exposure to the noise. Generic practices that will reduce noise from the site include:

- Increasing the distance between noise sources and sensitive receivers.
- Reducing the line-of-sight noise transmission to residences or other sensitive land uses.
- Constructing barriers that are part of the project design early in the project to introduce the mitigation of site noise.
- Installing purpose built noise barriers and enclosures.

7.2.2 VIBRATION

Vibration can be more difficult to control than noise, and there are few generalizations that can be made about its control. It should be kept in mind that vibration may cause disturbance by causing structures to vibrate and radiate noise in addition to perceptible movement. Impulsive vibration can, in some cases, provide

a trigger mechanism that could result in the failure of building components that had previously been in a stable state.

During the erection of the new structure, some vibrations (transmitted through the existing structures nearby the demolition sites) are expected, being more of a concern for the surrounding sensitive receivers.

It can also trigger annoyance being elevated into action by occupants of exposed buildings, and should therefore be included in the planning of communication with impacted communities. It should be remembered that failures, sometimes catastrophic, can occur as a result of conditions not directly connected with the transmission of vibrations, e.g. the removal of supports from retaining structures to facilitate site access.

Where site activities may affect existing structures, a thorough engineering appraisal should be made at the planning stage.

General principles of seeking minimal vibration at receiving structures should be followed in the first instance. Predictions of vibration levels likely to occur at sensitive receivers are recommended when they are relatively close, depending on the magnitude of the source of the vibration or the distance associated. Relatively simple prediction methods are available in texts, codes of practice or other standards, however it is preferable to measure and assess site transmission and propagation characteristics between source and receiver locations.

Guidance for measures available for the mitigation of vibration transmitted can be sought in more detailed standards, such as BS5228.2:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites. Vibration'* or policy documents, such as the NSW DEC *'Assessing Vibration: A technical guideline'*.

Identifying the strategy best suited to the control of vibration follows a similar approach to that of noise avoidance, control at the source, control along the propagation path, control at the receiver, or a combination of these. It is noted that vibration sources can include stationary plants (pumps and compressors), portable plants (jackhammers and pavement vibrators), mobile plants, pile-drivers, tunneling machines and activities, and blasting, amongst others. Unusual ground conditions, such as a high water-table, can also cause a difference to expected or predicted results, especially when considering the noise propagated from piling.

7.3 UNIVERSAL WORK PRACTICES

To minimise construction noise complaints due to preventable activities at any time of the day, the following work practices shall be considered:

- Regularly train workers and contractors (such as a toolbox talks) to use equipment in ways to minimise noise.
- Ensure site managers periodically check the site and nearby residences and other sensitive land use for noise problems so that solutions can be quickly applied.
- Include in tenders, employment contracts, subcontractor agreements and work method statements clauses that require minimisation of noise and compliance with directions from management to minimise noise.
- Avoid the use of radios or stereos outdoors where neighbours can be affected.
- Avoid shouting, and minimise talking loudly and slamming vehicle doors.
- Keep truck drivers informed of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices.

- Develop a one-page summary of approval or consent conditions that relate to relevant work practices, and pin it to a noticeboard so that all site operators can quickly reference noise information.
- Workers may at times need to discuss or negotiate practices with their managers.

For work practices during night-time, the following shall be considered:

- Avoid the use of equipment which generates impulsive noise.
- Minimise the need for reversing or movement alarms.
- Avoid dropping materials from a height.
- Avoid metal-to-metal contact on equipment.
- Schedule truck movements to avoid residential streets if possible.
- Avoid mobile plant clustering near residences and other sensitive land uses.
- Ensure periods of respite are provided in the case of unavoidable maximum noise level events.

7.4 CONSULTATION AND NOTIFICATION

The community is more likely to be understanding and accepting of noise if the information provided is frank, does not attempt to understate the likely noise level, and if commitments are firmly adhered to. Community Consultation shall be as per EIS requirements and prepared accordingly. Refer to Appendix C for the Community Communication Strategy provided by Hansen Yuncken.

7.5 MANAGING NOISE LEVELS AND MAINTENANCE PROGRAM FOR PLANT AND EQUIPMENT

In terms of both cost and results, controlling noise at the source is one of the most effective methods of minimising the noise impacts from any construction activities. Recommendations for managing noise levels from plant and equipment are as follows:

- Use quieter methods:
  - Examine and implement, where feasible and reasonable, alternatives to rock-breaking work methods, such as hydraulic splitters for rock and concrete, hydraulic jaw crushers, chemical rock and concrete splitting, and controlled blasting such as penetrating cone fracture. The suitability of alternative methods should be considered on a case-by-case basis.
  - Use alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric controlled units where feasible and reasonable. Where there is no electricity supply, use an electrical generator located away from residences.
- Use quieter equipment:
  - Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine. For example, rubber wheeled tractors can be less noisy than steel tracked tractors.
  - Noise labels are required by NSW legislation for pavement breakers, mobile compressors, chainsaws and mobile garbage compactors. These noise labels can be used to assist in selecting less noisy plant.
  - Pneumatic equipment is traditionally a problem – select super silenced compressors, silenced jackhammers and damped bits where possible.
  - When renting, select quieter items of plant and equipment where feasible and reasonable.

- When purchasing, select, where feasible and reasonable, the most effective mufflers, enclosures and low-noise tool bits and blades. Always seek the manufacturer's advice before making modifications to plant to reduce noise.

- Operate plant in a quiet and efficient manner:
  - Reduce throttle setting and turn off equipment when not being used.
  - Examine and implement, where feasible and reasonable, the option of reducing noise from metal chutes and bins by placing damping material in the bin.

The Contractor shall prepare and implement a regular plant and equipment use and maintenance program. This is to ensure that 'noisy' equipment or tools are not used. This program should ensure that the contractor will:

- Regularly inspect and maintain equipment to ensure it is in good working order. Also check the condition of mufflers.
- Equipment must not be operated until it is maintained or repaired, where maintenance or repair would address the annoying character of noise identified.
- For machines with enclosures, check that doors and door seals are in good working order and that the doors close properly against the seals.
- Return any hired equipment that is causing noise that is not typical for the equipment – the increased noise may indicate the need for repair.
- Ensure air lines on pneumatic equipment do not leak.

7.6 WORKS TIMING RESTRICTIONS AND SCHEDULING

Works should be carried out during periods specified as per the approved Construction Hours. Scheduling noisy work during periods when people are least affected reduces noise impact on those. Recommendations for work scheduling are as follows:

- Provide respite periods.
- Schedule activities to minimise noise impacts:
  - Organise work to be undertaken during the recommended standard hours where possible.
  - When works outside the recommended standard hours are planned, avoid scheduling on Sundays or public holidays.
  - Schedule work when neighbours are not present.
  - Schedule noisy activities around times of high background noise (local road traffic or when other local noise sources are active) where possible to provide masking or to reduce the amount that the construction noise intrudes above the background.
  - Consult with affected neighbours about scheduling activities to minimise noise impacts.
- Organise deliveries and access:
  - Nominate an off-site truck parking area, away from residences, for trucks arriving prior to gates opening.
  - Amalgamated loads can lead to less noise and congestion in nearby streets.
  - Optimise the number of vehicle trips to and from the site – movements can be organised to amalgamate loads rather than using a number of vehicles with smaller loads.

- Inform, and consult where possible, the potentially noise-affected residences or other sensitive land uses of designated access routes to and from site, and make drivers aware of nominated vehicle routes.
- Schedule deliveries to nominated hours only.

7.7 ADDITIONAL NOISE AND VIBRATION CONTROLS

There will likely be times or situations when construction works exceed the stated criteria at the nearest receivers, particularly when works occur in the areas closer to the receiver(s). Therefore, all feasible and reasonable noise control measures should be considered.

If, during construction, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices presented in this Section shall be considered to minimise the noise and vibration impacts of the project on the surrounding noise sensitive receivers:

- Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated receiver. For example, the residential receivers are likely to be more sensitive to noise before 8am and after 6pm.
- Consider implementing equipment specific temporary screening for noisy equipment, or other noise control measures recommended in Appendix C of AS2436:2010. This will most likely apply to noisier hand-held items such as jack-hammers and circular saws.
- Locate specific activities such as carpentry areas (use of circular saws, etc.) to internal spaces or where shielding is provided by existing structures or temporary screening.
- Limit the number of trucks and heavy vehicles on site at any given time through scheduling deliveries at differing times.
- Traffic rules should be prepared to minimise the noise impact on the community.
- When loading and unloading trucks, adopt best practice noise management strategies to avoid materials being dropped from height.
- Avoid unnecessary idling of trucks and equipment. Vehicles and equipment to be turned off when not in use.
- Ensure that any miscellaneous equipment (extraction fans, hand tools, etc.) not specifically identified in this plan incorporates silencing/shielding equipment as required to meet the noise criteria.

If the measured construction vibration levels exceed the appropriate criteria during the works, one or more of the following measures should be taken:

- Modifications to construction equipment used.
- Modifications to methods of construction.
- Rescheduling of activities to less sensitive times.

If the measures given cannot be implemented or have no effect on noise or vibration levels or impact generated, a review of the criteria should be undertaken and the noise and vibration strategy amended.

7.8 MONITORING PROGRAM

Where noise and vibration criteria are being exceeded or in response to valid complaints, noise and/or vibration monitoring should be undertaken. This would be performed inside the premises of the affected property and on site adjacent to the affected receivers.

Monitoring is to be undertaken by an experienced noise and vibration monitoring professional or an acoustic consultant. The results of any noise or vibration monitoring are to be provided to the relevant party or person in a timely manner allowing the builder to address the issue and respond to the complaints.

Noise and vibration monitoring can take two forms:

- Short-term monitoring: Short-term monitoring consists of attended monitoring when critical stages of the construction are occurring. This normally provides real-time assistance and guidance to the sub-contractor on site letting them know when the noise and vibration criteria are exceeded allowing the selection of alternative method on construction or equipment selection in order to minimise noise and vibration impacts.
- Long-term monitoring: Similarly long-term monitoring uses noise and vibration loggers providing real-time alerts to the builder / site manager when the noise and vibration criteria are exceeded. Typically, the noise and vibration loggers stay on site for a period of several months for the critical construction stages of the project. Sometimes the period of construction noise and vibration monitoring is dictated by the local authorities through the Conditions of Consent if applicable.

Both methodology are complementary and normally used simultaneously providing a significant of amount of data via the long-term monitoring but also providing information on the sources of noise and vibration generating exceedances via the short-term or attended monitoring.

The following may be included in a noise monitoring report:

- The type of monitoring conducted (for example, at a particular project stage or following complaints) and a brief statement of the measurement method.
- The noise / vibration conditions on the consent / licence, or the relevant noise management objectives.
- Descriptions of the nearest affected residences and other sensitive land uses or, in the case of complaints, description of the complainant location and complaint.
- Plan or diagram showing the location of the monitoring and the noise generating works.
- Description of the instrumentation used.
- Name and relevant qualifications or professional memberships of monitoring personnel.
- The weather conditions during monitoring.
- The time(s) and duration(s) of monitoring, including dates – in the case of complaints.
- A clear description of the construction activities taking place during the monitoring.
- The results of monitoring at each monitoring location, including a comparison with the consent conditions or relevant noise management objectives.
- A clear statement outlining the project's compliance or non-compliance with the conditions or objectives.
- Where the monitored level is higher than the conditions or objectives, the reasons for non-compliance should be stated, strategies for minimising noise identified and stated, and the appropriate actions to implement the strategies.

7.9 WORKERS' TRAINING AND AWARENESS

The Contractor shall provide all project personnel and subcontractors with training on the environmental obligations through project inductions, toolbox talks, and through Safety Works Methods (SWMs).

All Project work personnel and subcontractors shall undergo a general project induction prior to commencing work. This should include a noise component to reinforce the importance of noise issues and the measures that will be implemented to protect the environment.

All inductions shall be carried out by the site manager, or his designate in the site office as appropriate. During the induction, each contractor / worker shall be taken around the site to ensure they are fully aware of the exclusion zones and site specific environment.

Site inductions and daily SWMs and toolbox talks will highlight the specific environmental requirements and activities being undertaken at each work area which will include relevant noise management matters.

7.10 OCCUPATIONAL HEALTH AND SAFETY

In addition to potential noise and vibration impacts on the community and structures, construction noise and vibration can also have an adverse impact upon the health of workers. It is important that Contractors adopt noise management strategies to prevent or minimise worker exposure to excessive noise and vibration. Such measures will also assist in reducing noise and vibration impacts on the surrounding community.

The National Occupational Health and Safety Commission (NOHSC) recommends a maximum acceptable workplace noise exposure level of 85dB(A) ($L_{Aeq,8h}$) for an eight-hour time period.

Personnel involved in operations should be issued with ear plugs or ear muffs which must be used whenever noise levels interfere with normal speech when individuals are standing at a distance of 1m from each other, or when the $L_{Aeq,8hr}$ exceeds 85dB(A).

Signs should be erected and made visible at the entry to all areas where noise levels will exceed 85dB(A).

7.11 CONSTRUCTION TRAFFIC ROUTES

The Contractor shall establish and implement traffic routes for deliveries to the site, which minimise the noise impact on surrounding noise sensitive receivers as best possible.

8 CONCLUSIONS

A construction noise and vibration assessment has been carried out for the proposed works for the Newcastle High School Redevelopment (NHSR).

In particular, this report identifies the Contractor's obligations and the requirements to manage noise and vibration during construction such that Contractor can make the necessary allowances within the construction costs, programmes and work methodologies.

The responsibilities of all stakeholders are identified and a framework for the management of noise and vibration during construction works is provided.

This report establishes relevant noise level criteria, details the acoustic assessment and provides comments and recommendations for the proposed development.

Potential construction noise and vibration impacts on the surroundings have been presented in this report and recommendations based on the relevant guidelines are provided. It is expected that the predicted exceedance of the NMLs in the surrounding receivers triggers the proponent to apply all reasonable and feasible work practices to minimise the noise as much as possible, and community consultation, as per the requirements of the ICNG. Refer to Section 6 for details.

For each of the work stages and associated plant, assuming that they are exceeding the noise level criteria, the noise control measures presented in Section 7 shall be considered and implemented wherever reasonable and feasible in order to minimise any potential noise impact. Operation time restrictions shall be applied to 'noisy' construction plant to minimise noise impact to the nearest sensitive receivers.

The information presented in this report shall be reviewed if any modifications to selection of equipment / machinery, construction methodologies and modifications to the works construction program.

Based on the information presented in this report, relevant objectives will be satisfied and therefore approval is recommended to be granted.

APPENDIX A – LONG TERM NOISE MONITORING

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

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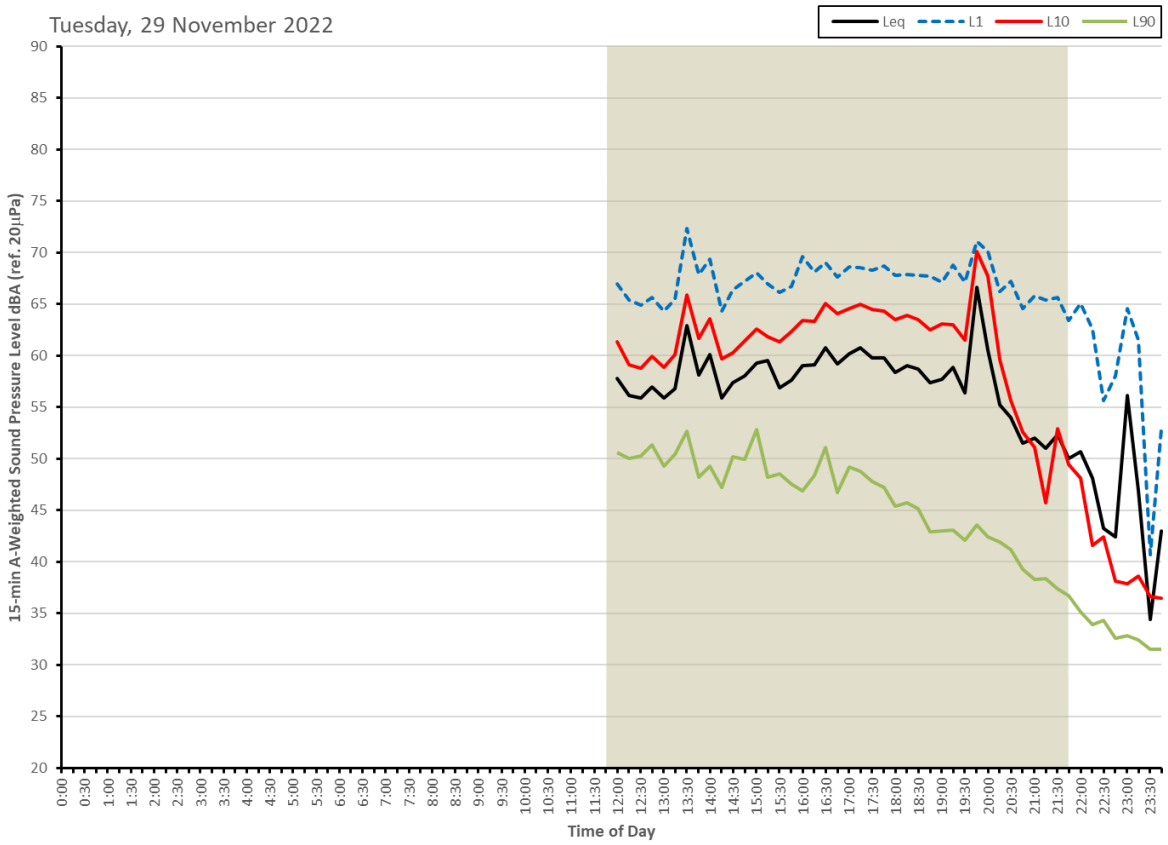

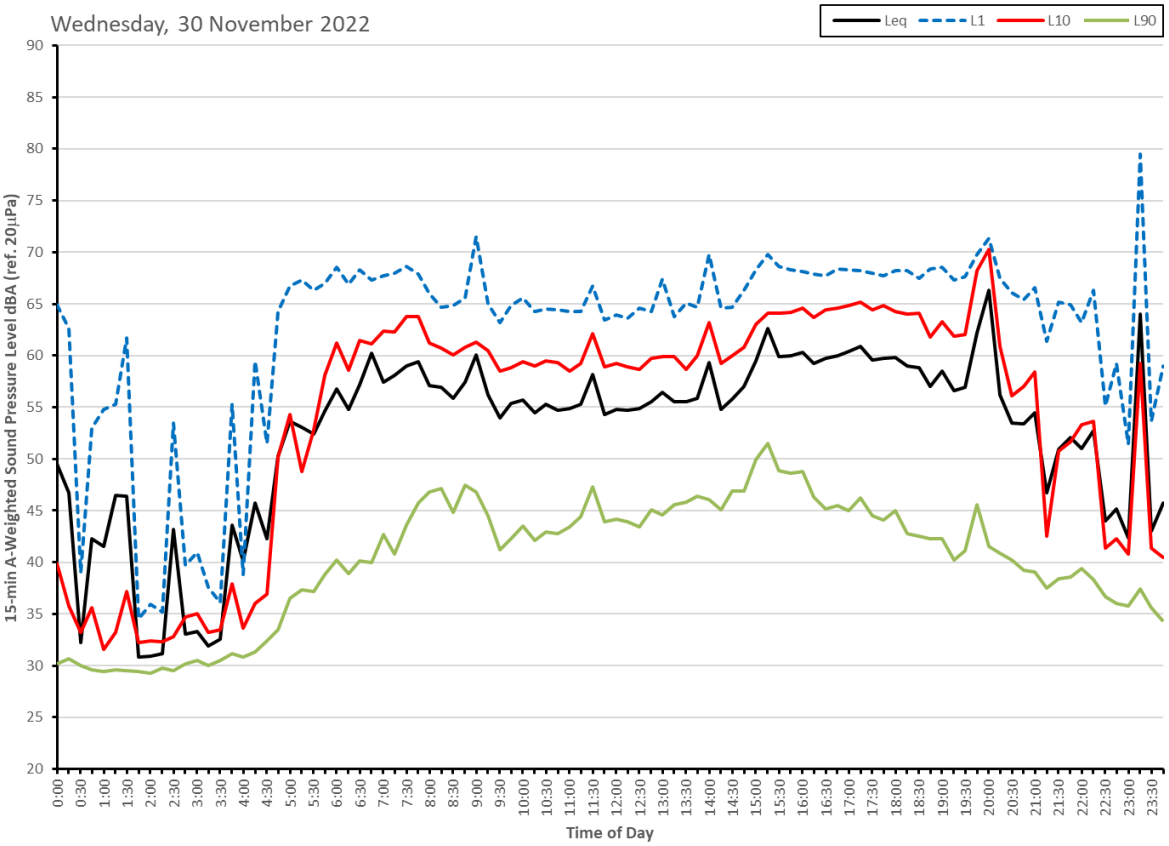

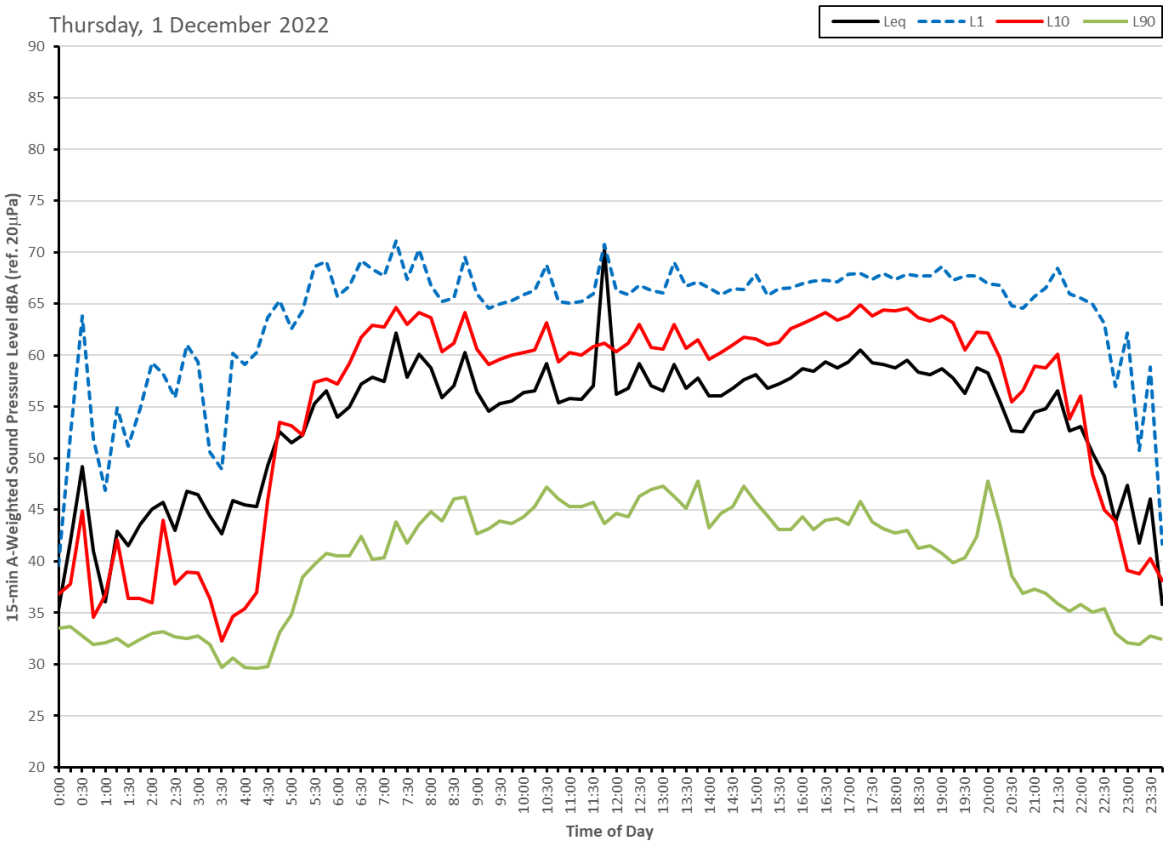
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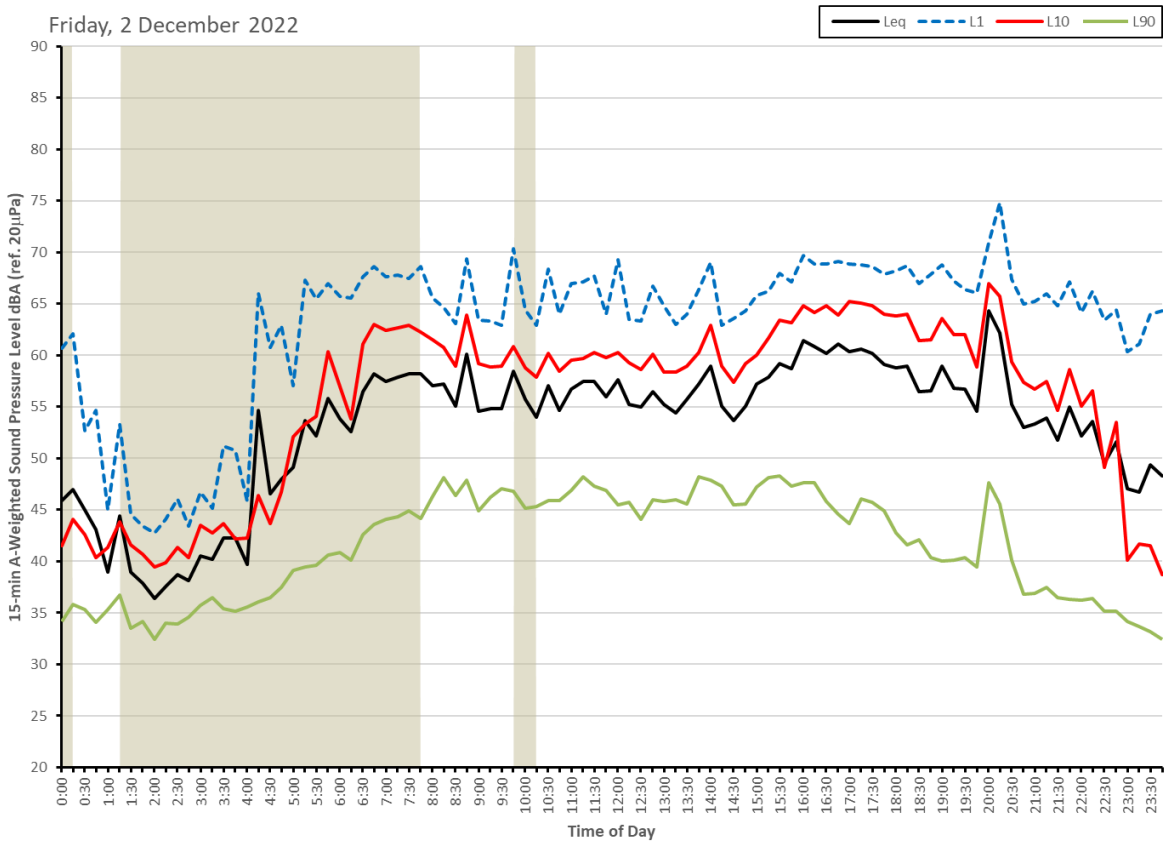
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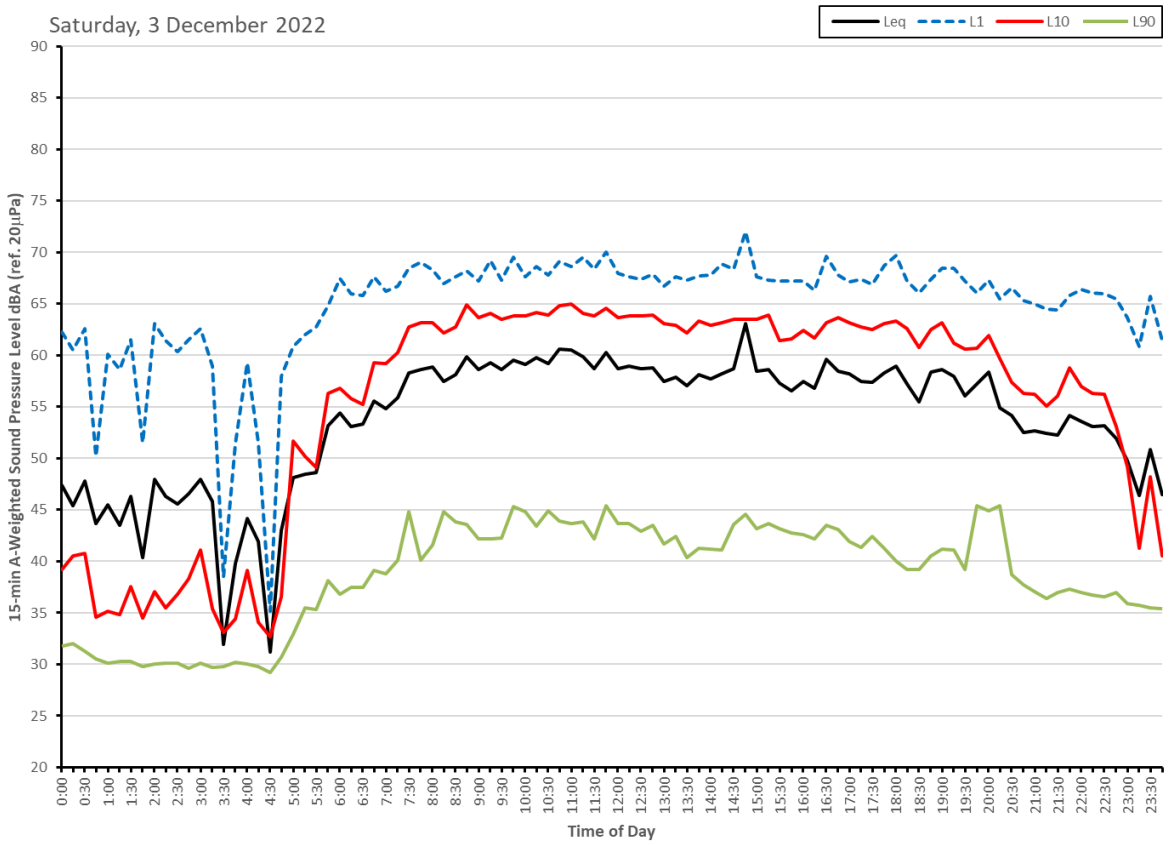
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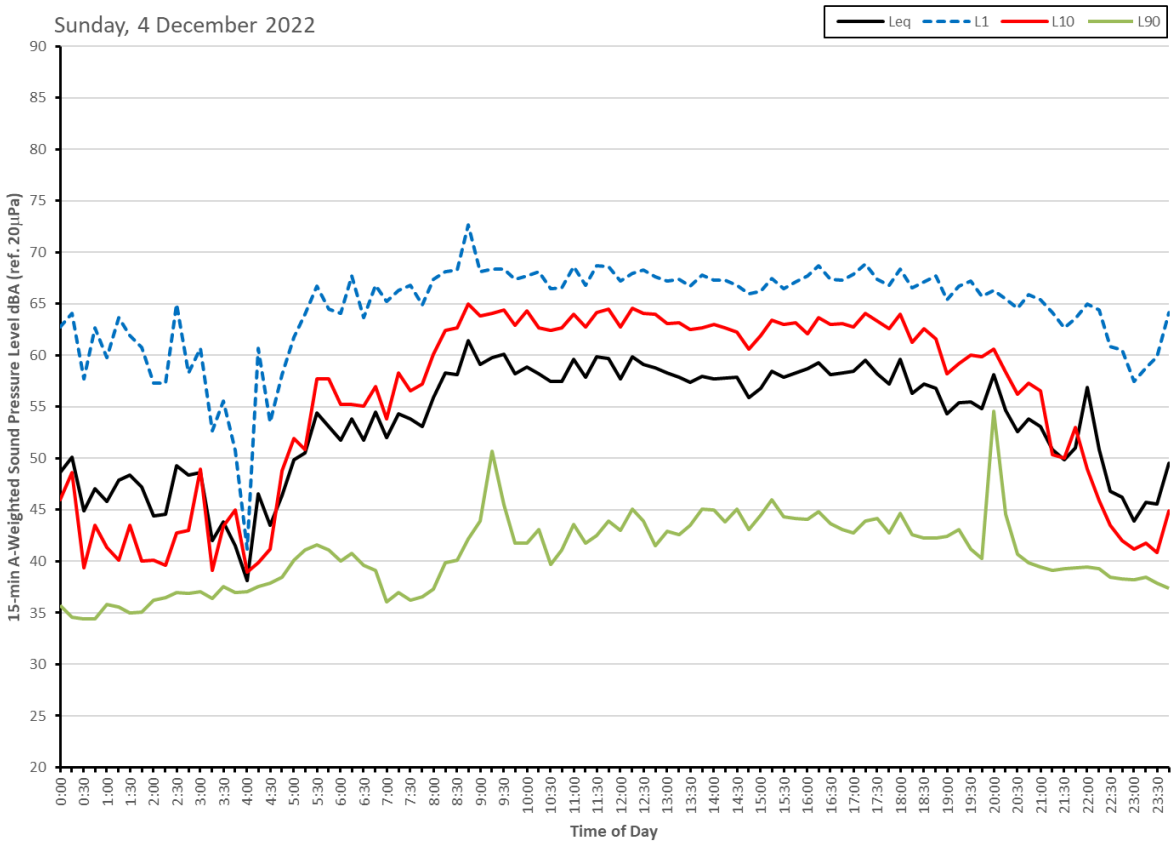
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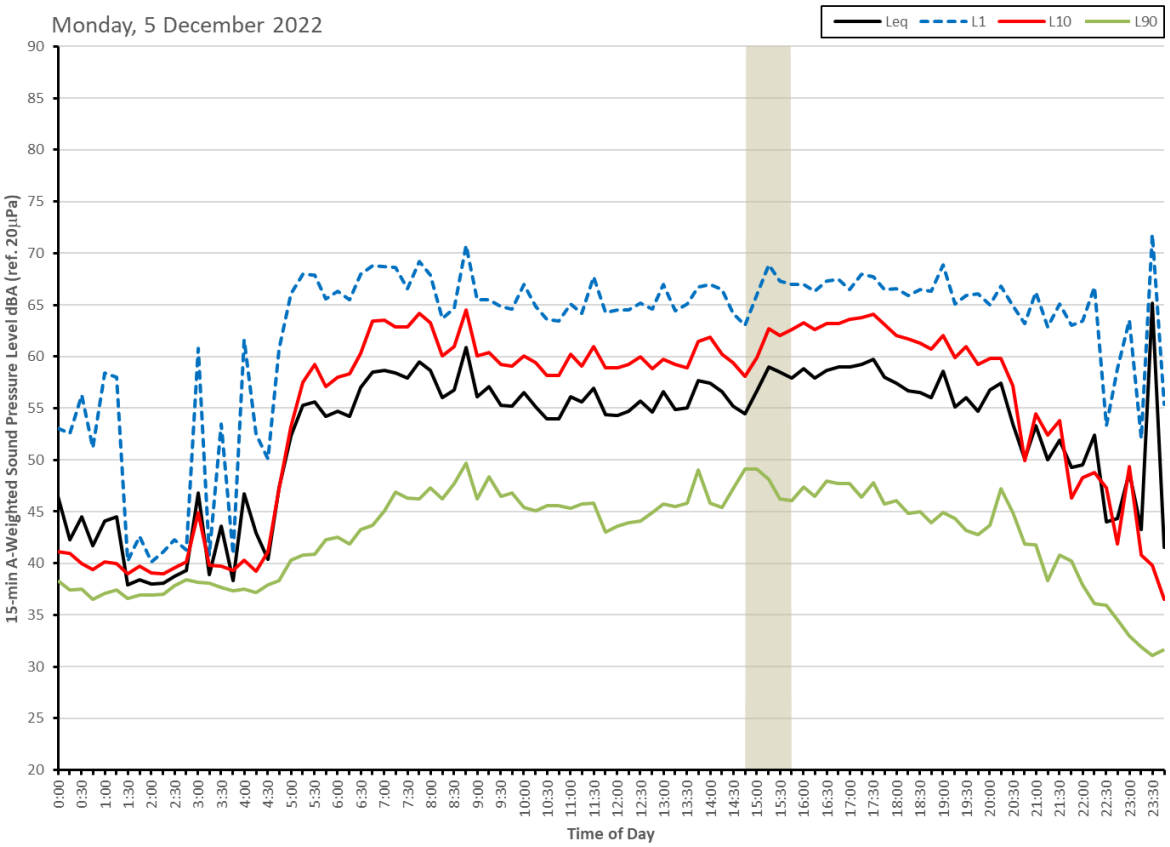
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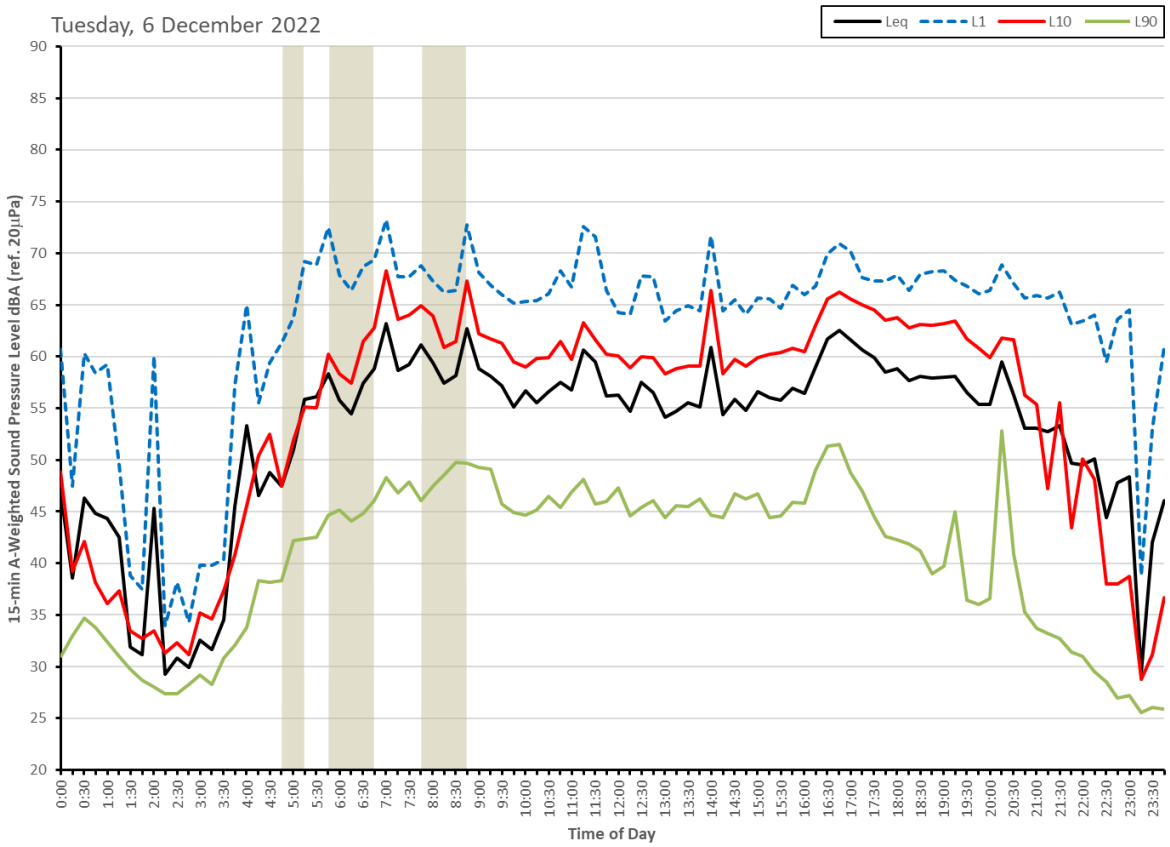
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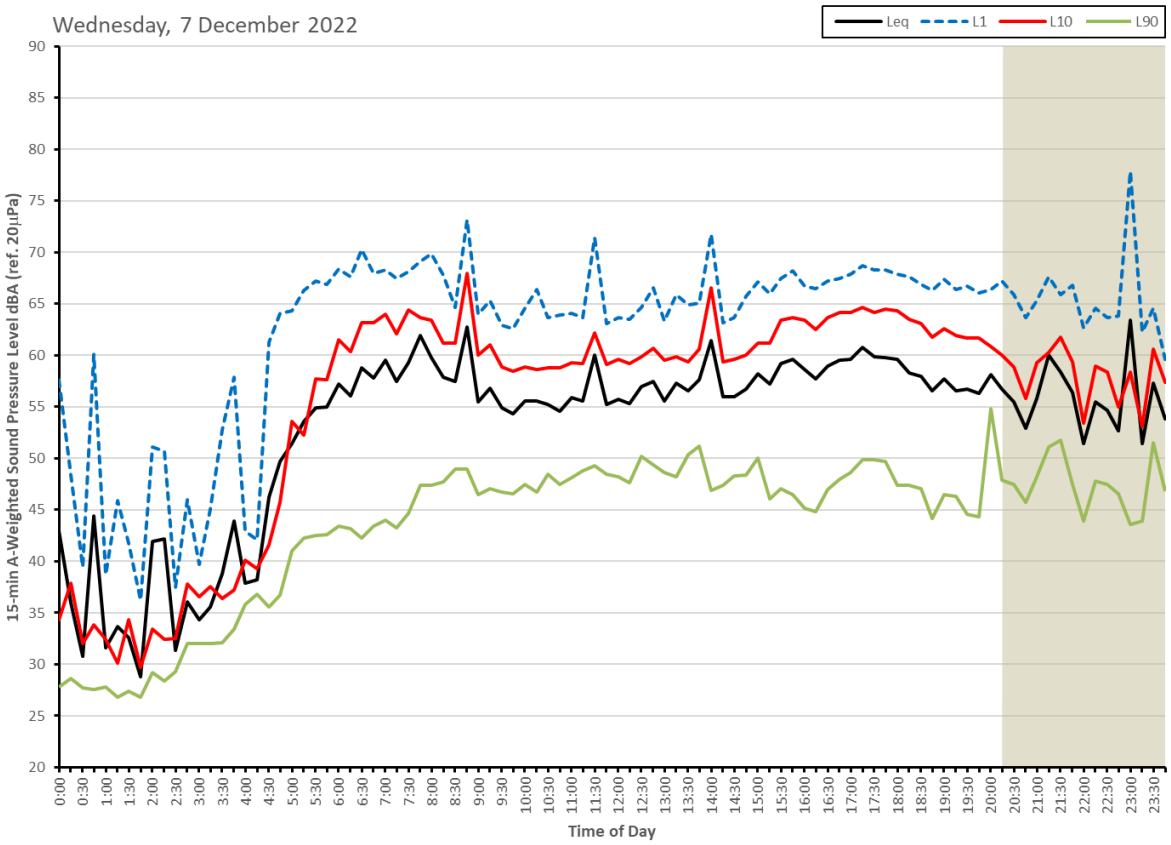
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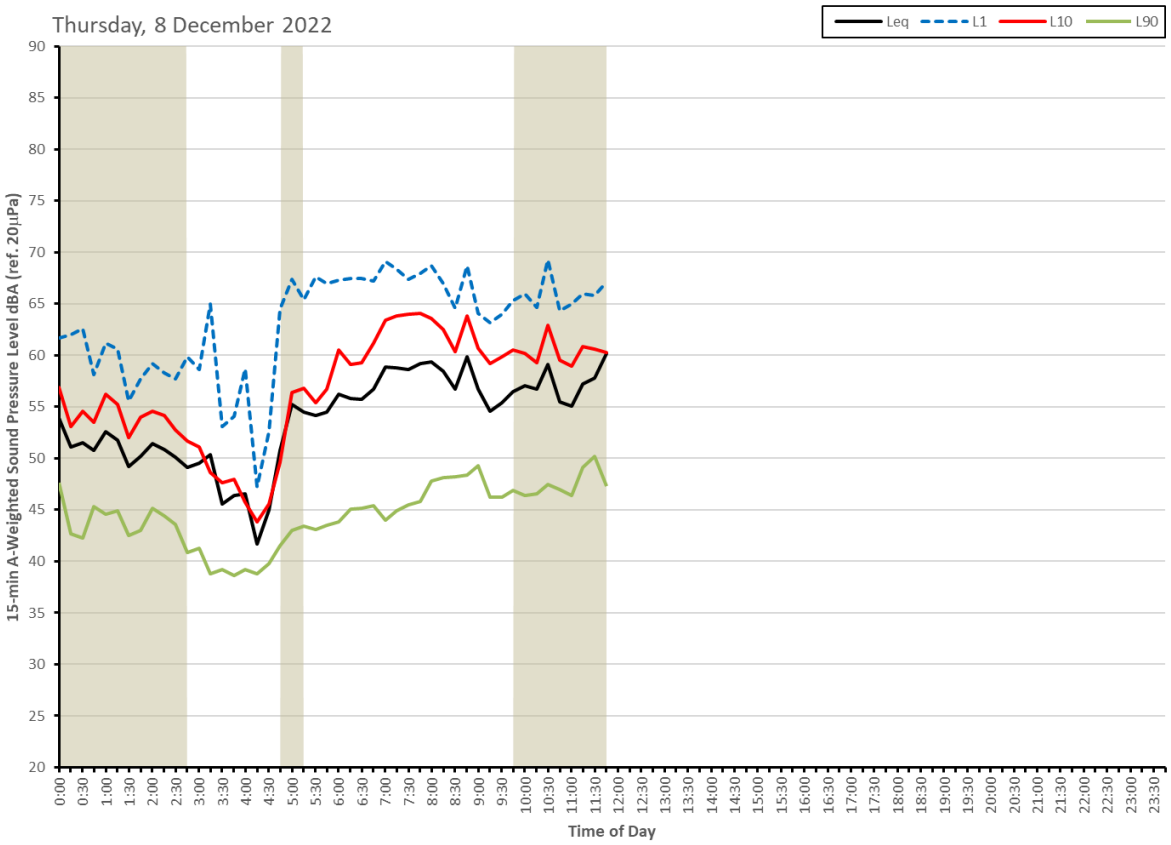
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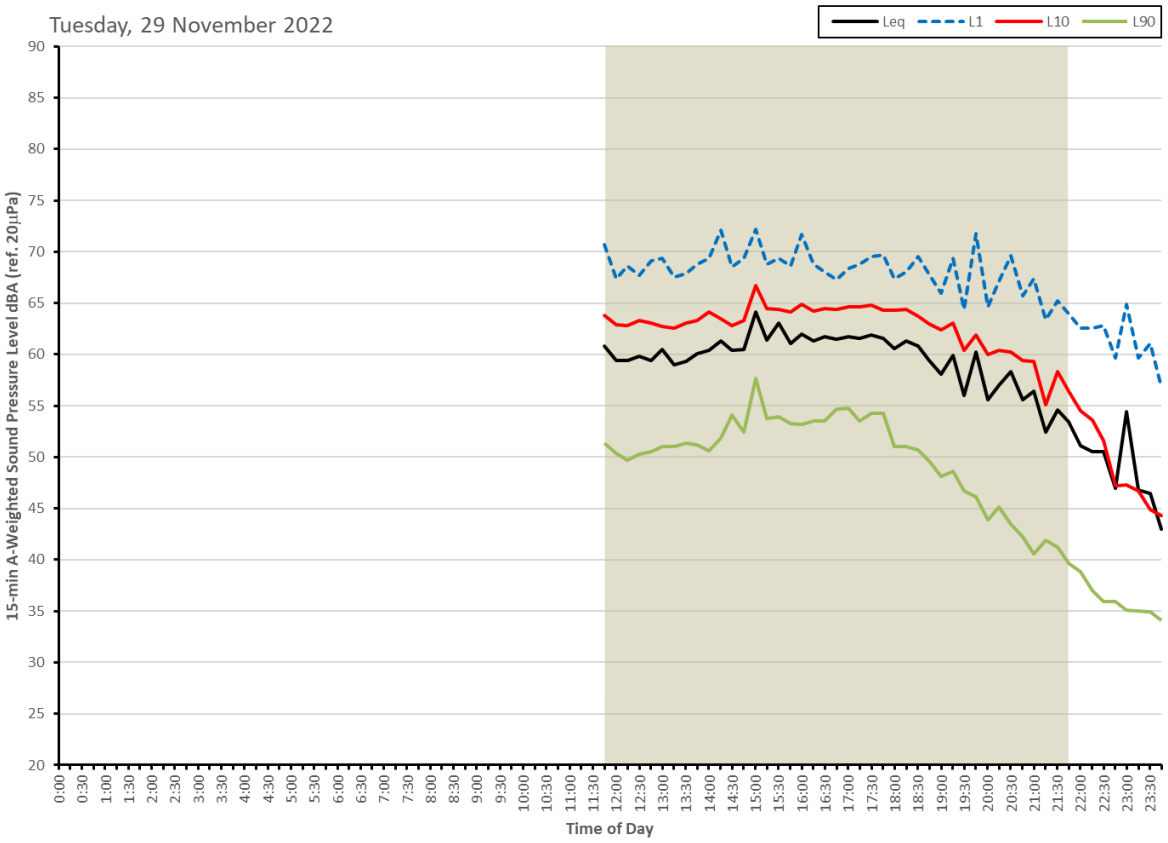

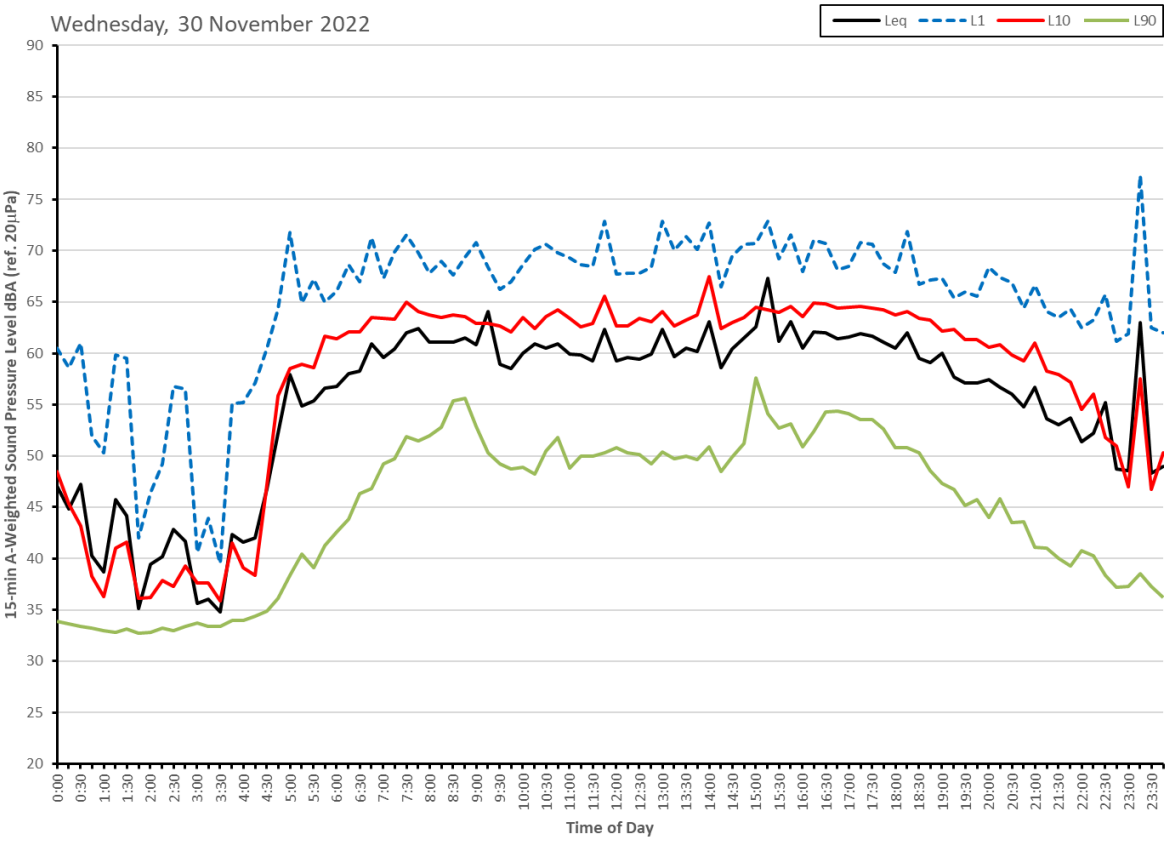

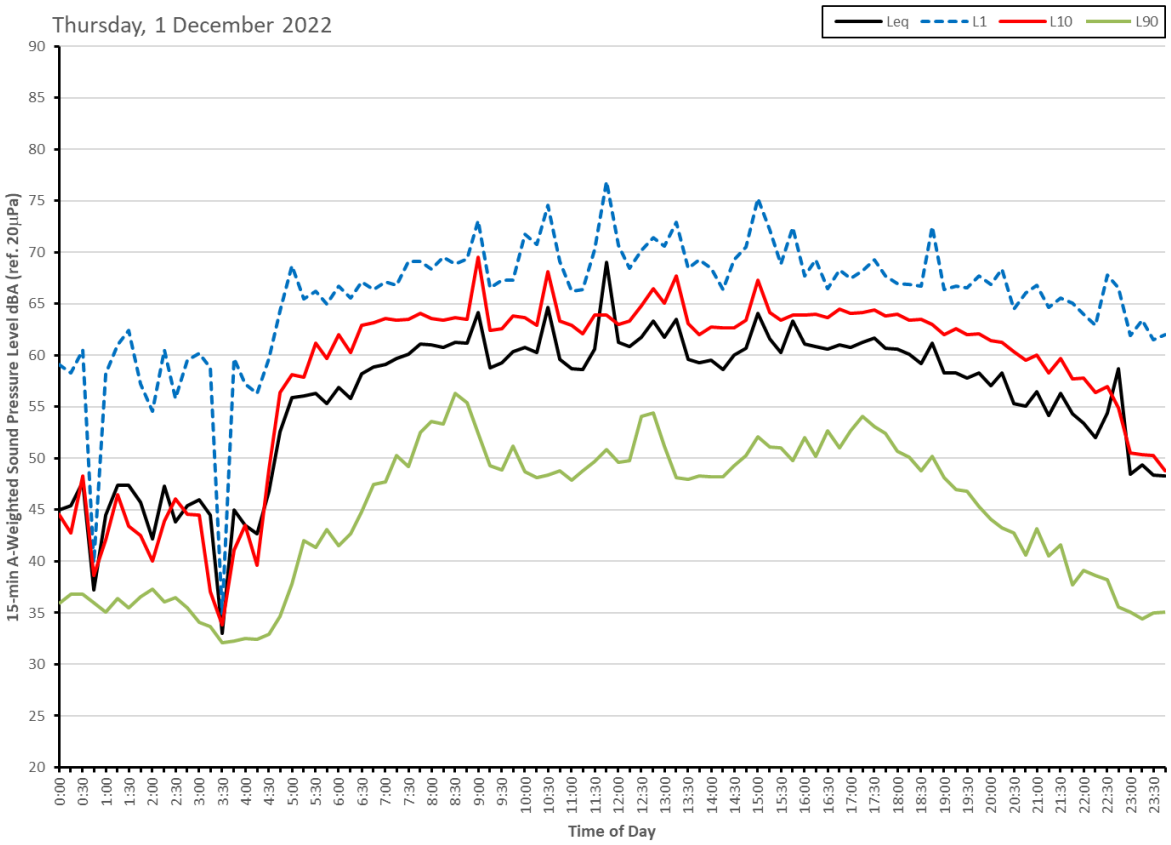
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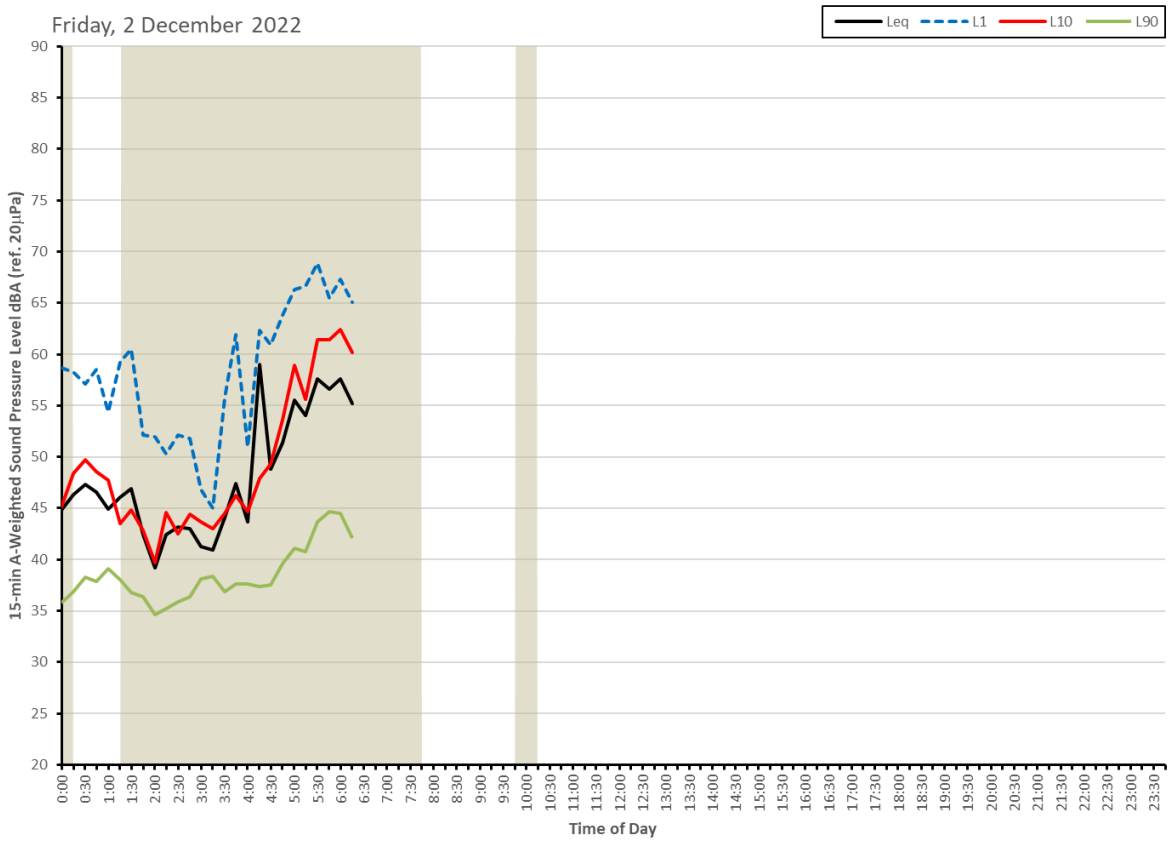
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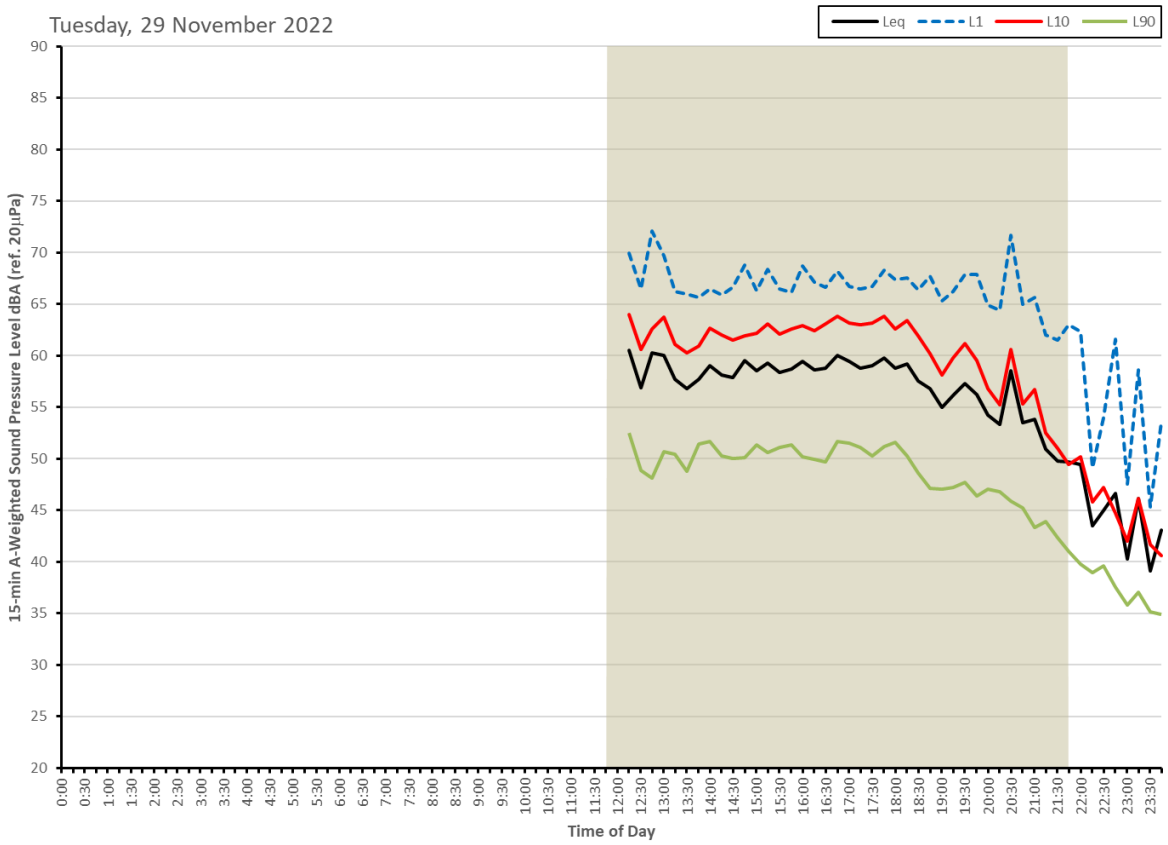

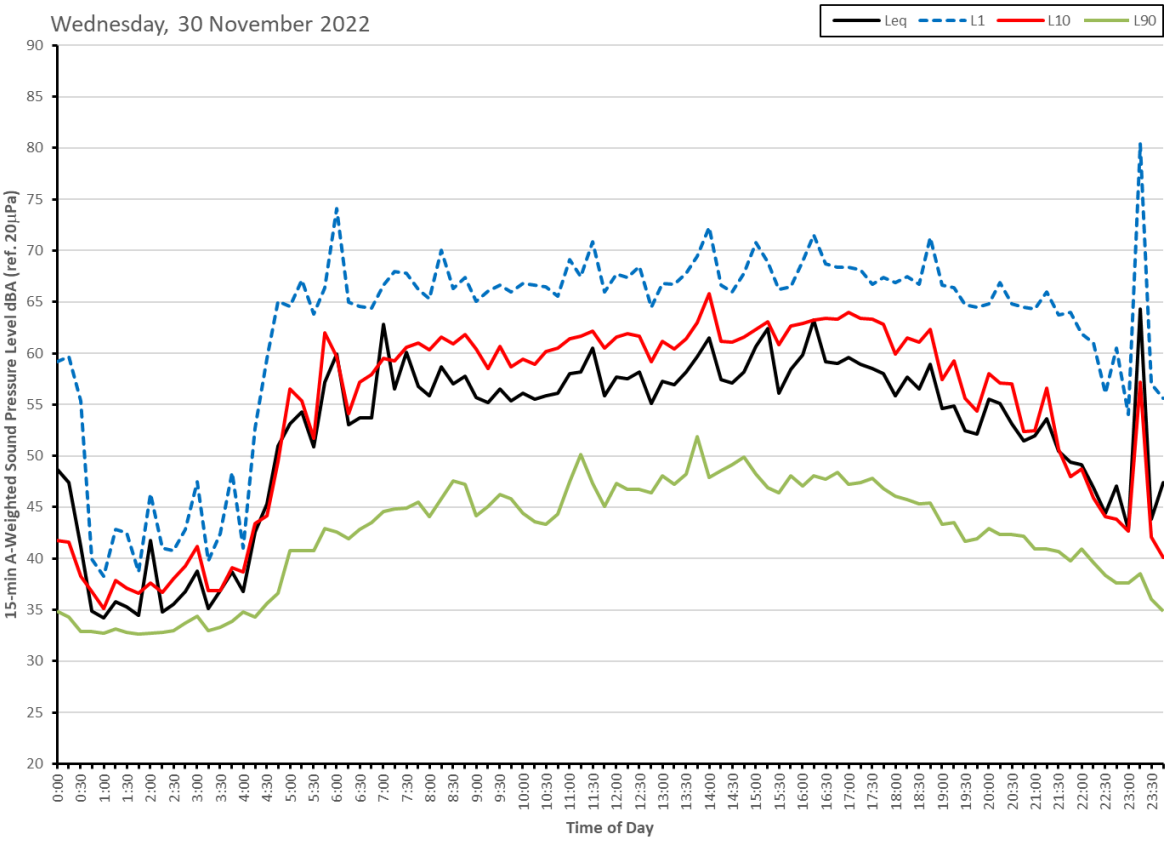

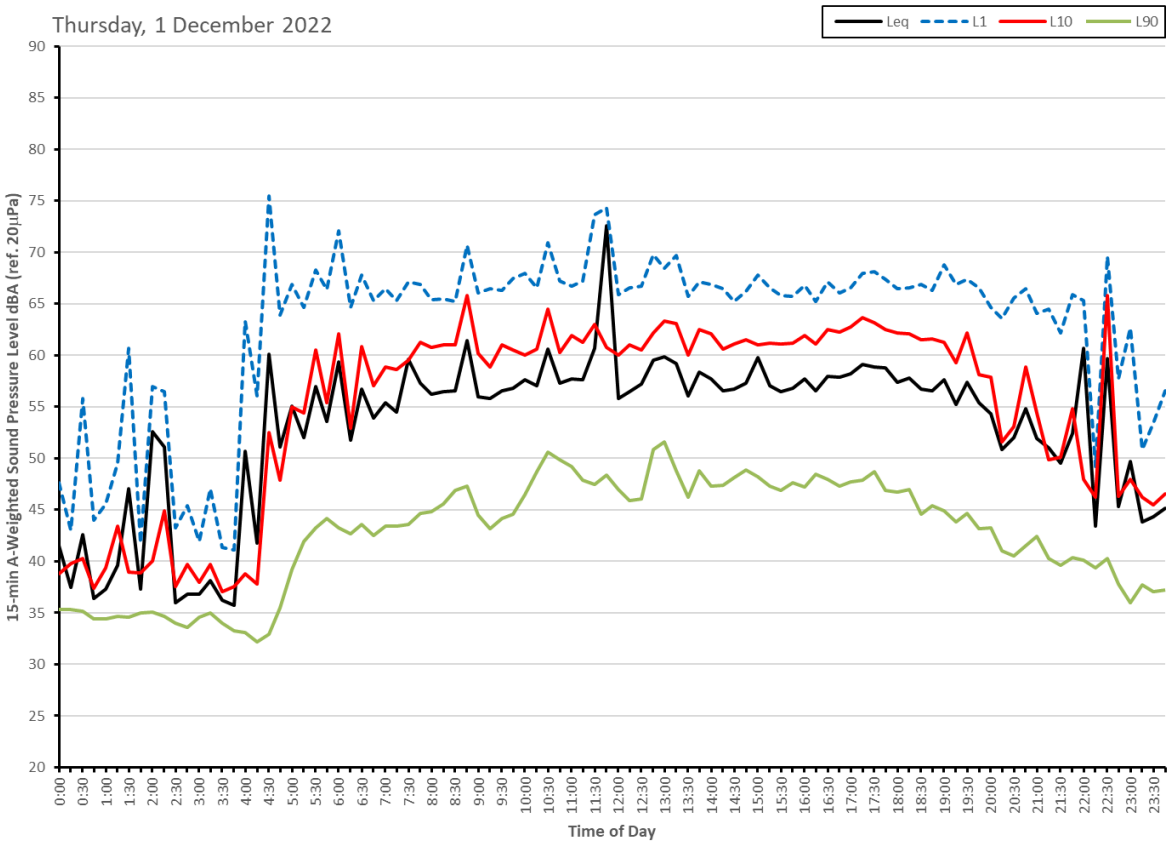
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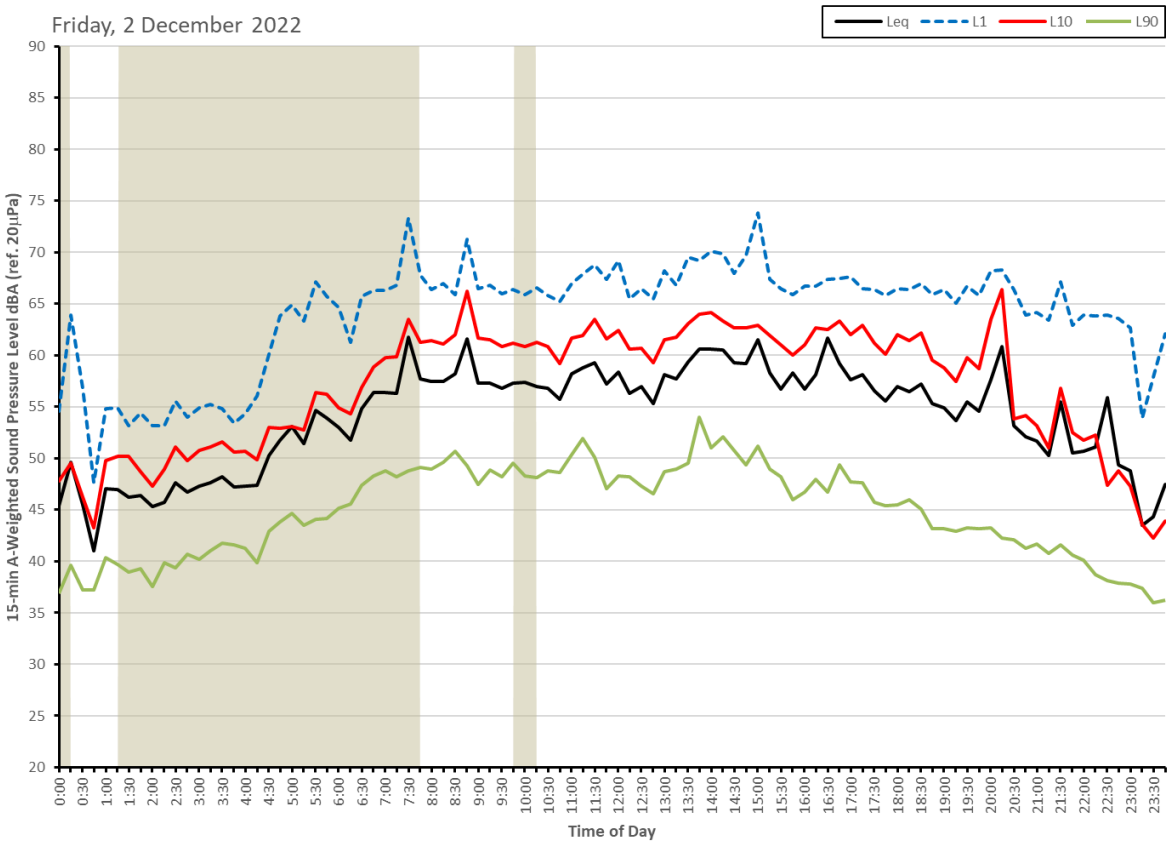
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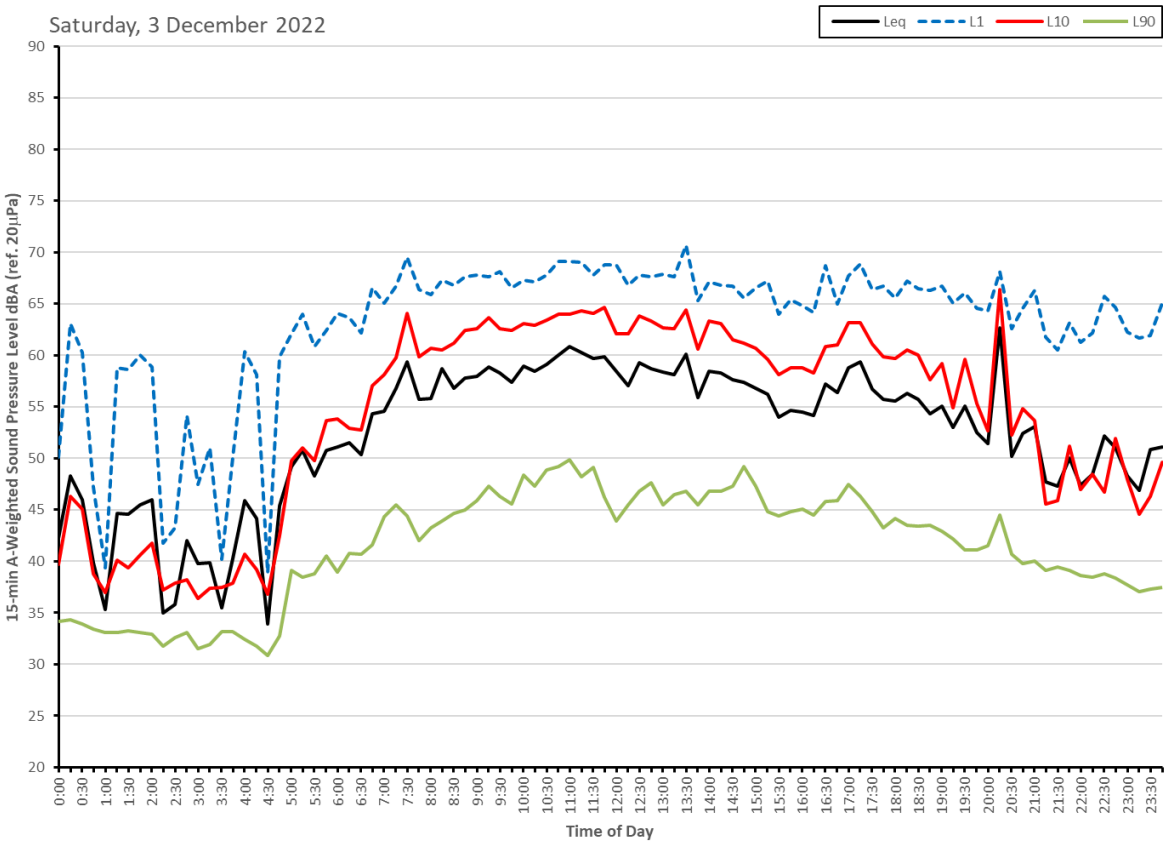
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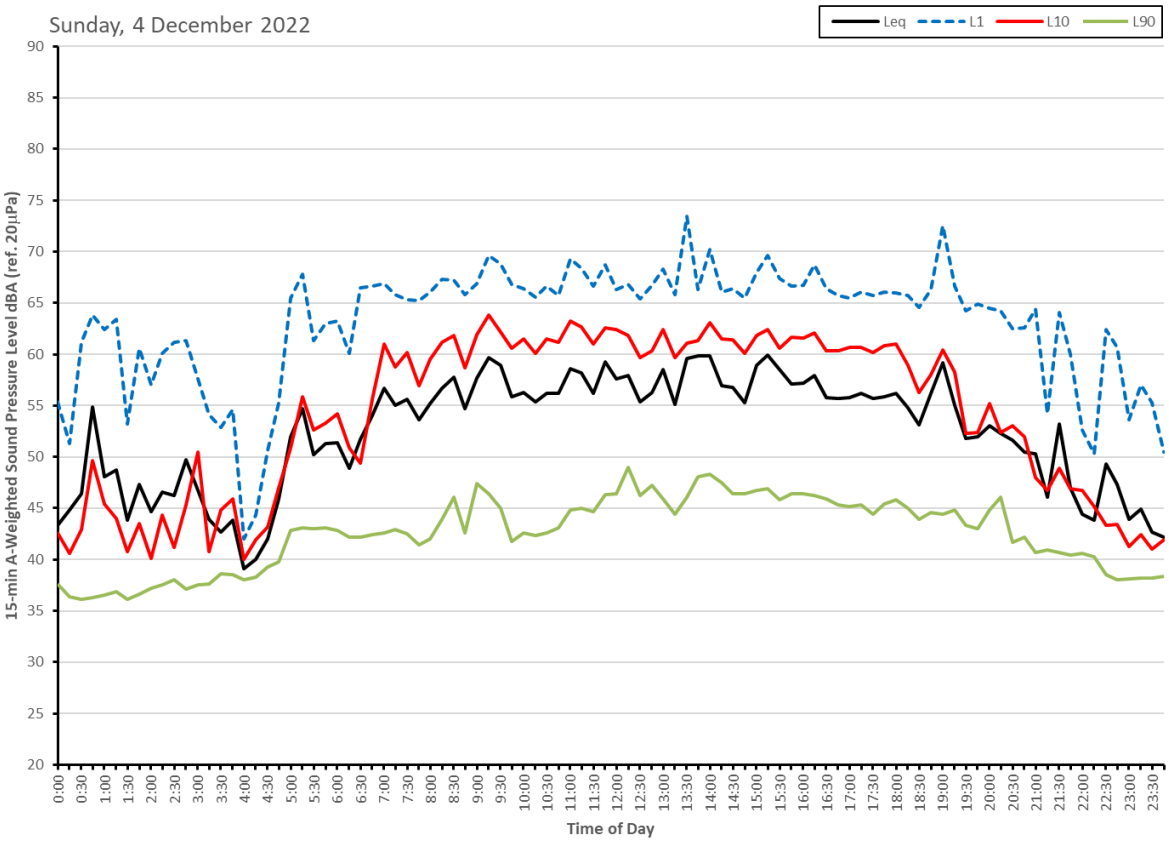
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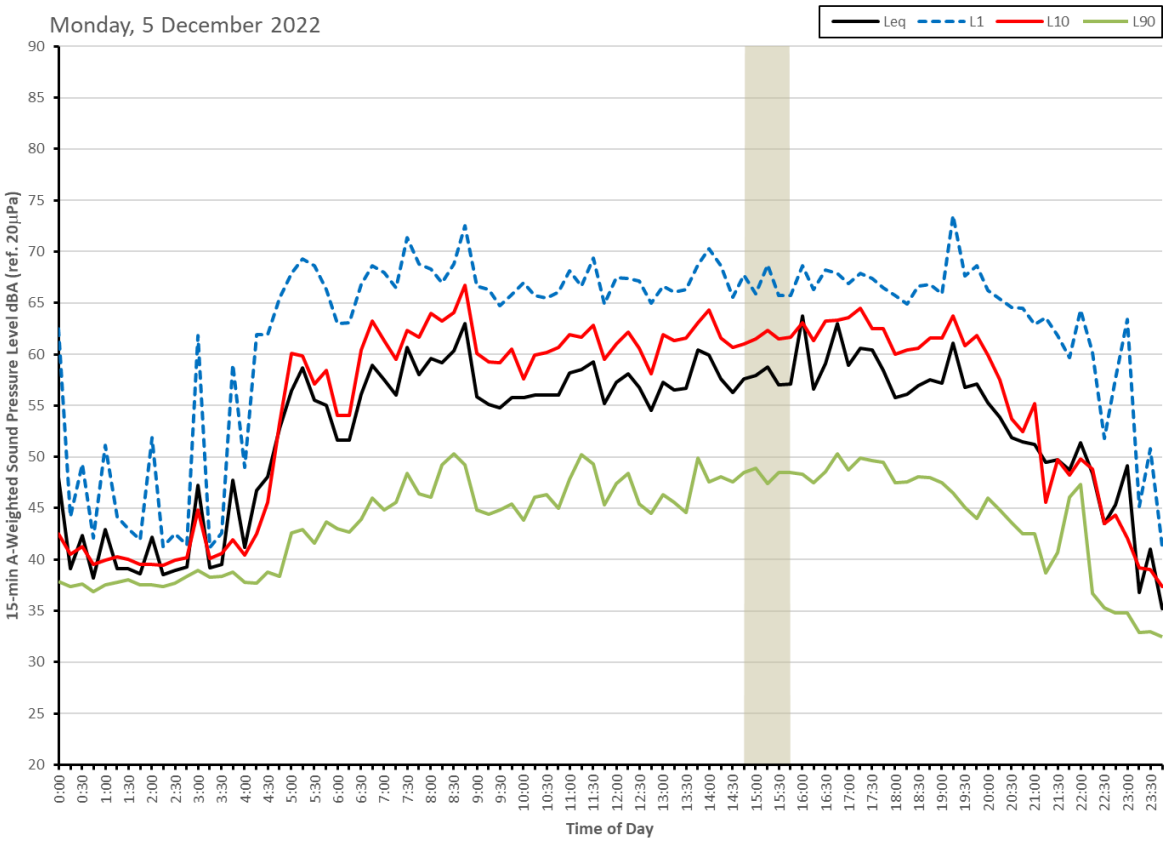
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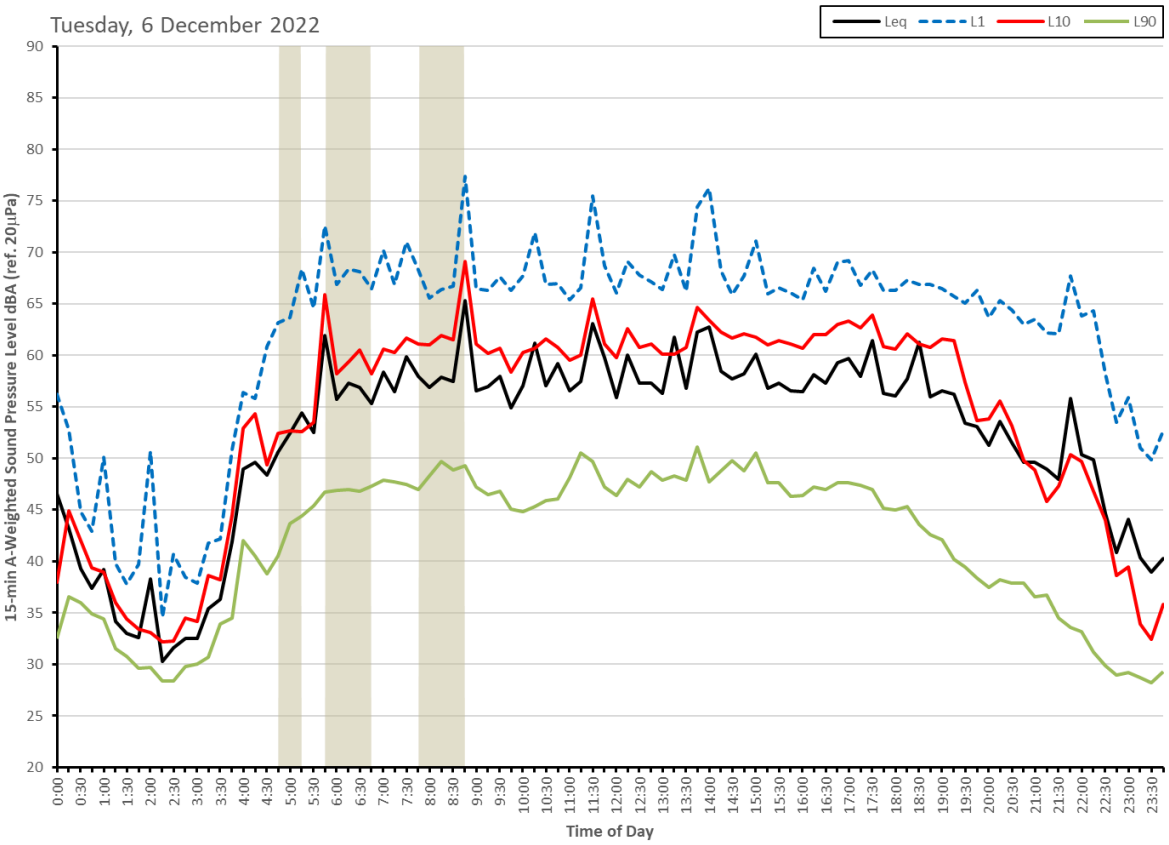
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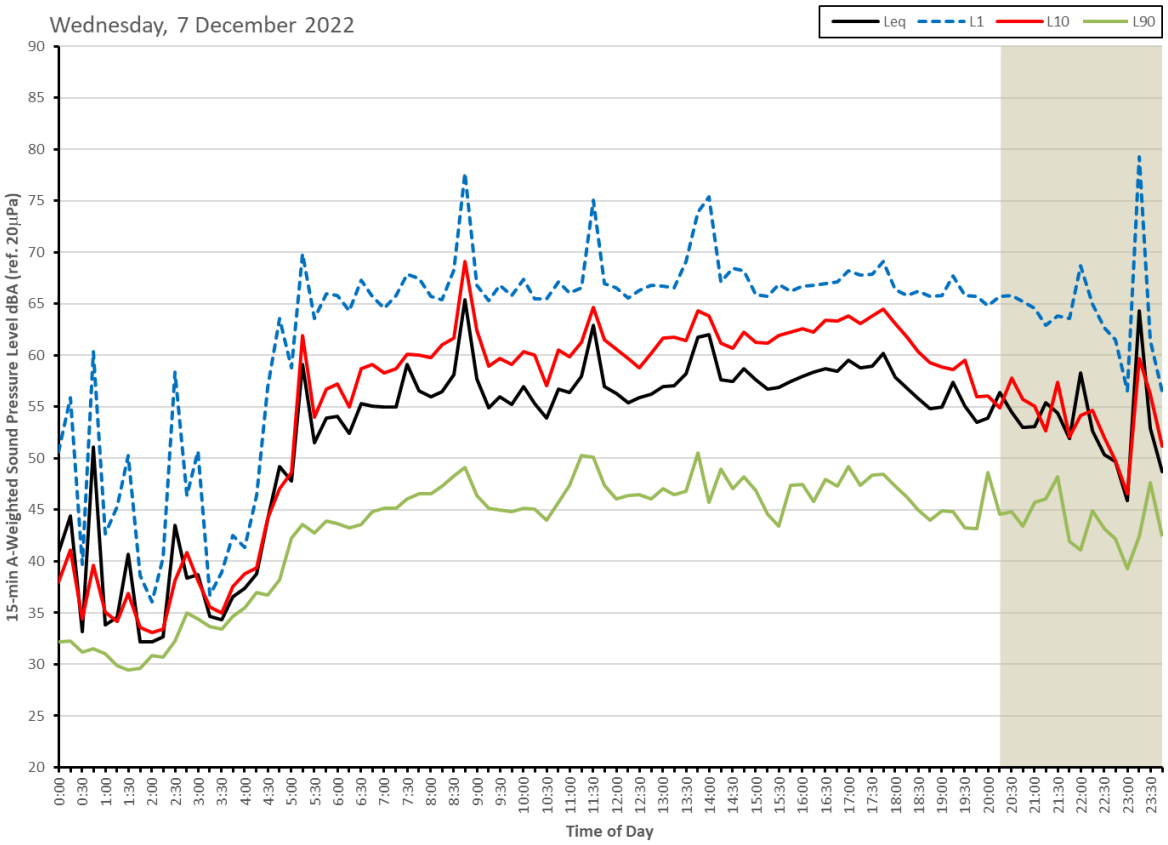
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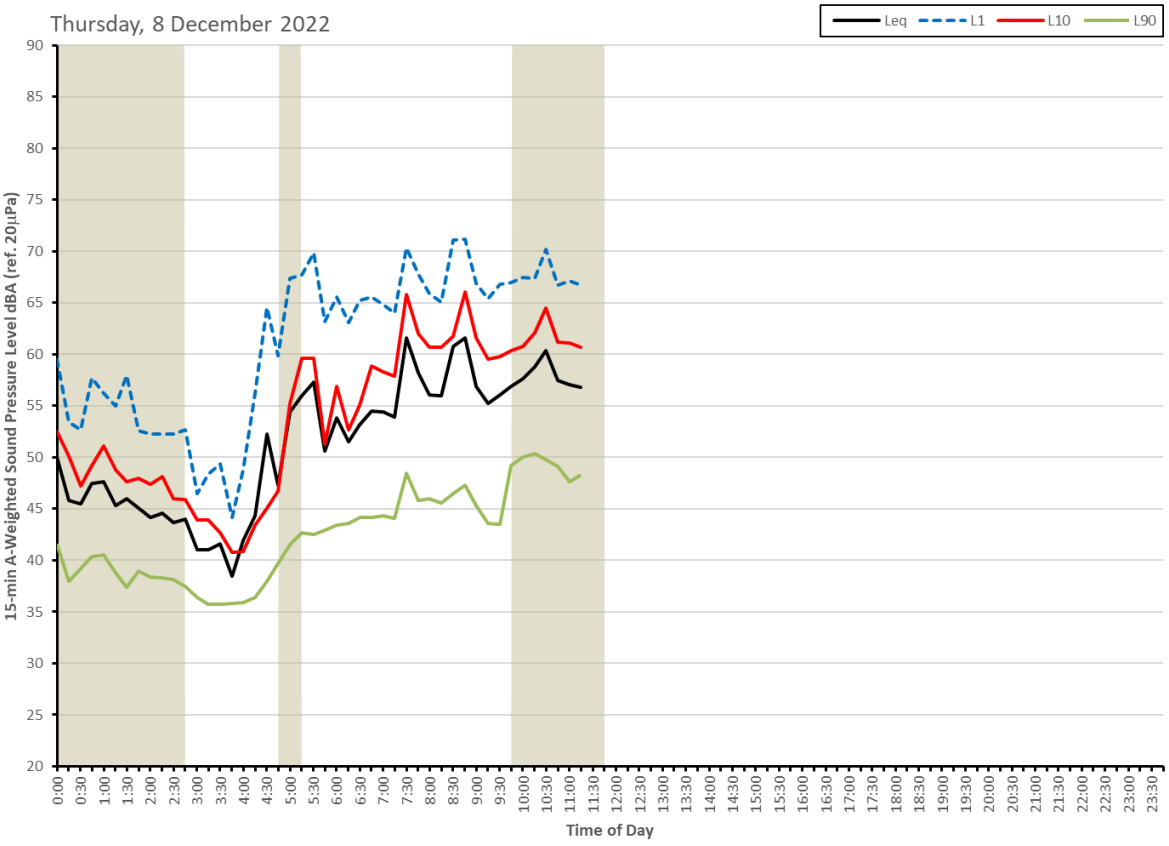
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APPENDIX B – CURRICULUM VITAE

SEAN MATTHEWS | SENIOR ACOUSTICS ENGINEER

Sean is an experienced Senior Acoustics Engineer with diverse and extensive experience in the field of acoustic consulting.

With a strong understanding of other disciplines and an intimate focus on coordination, he is able to provide effective design solutions. The diversity of projects from large residential to commercial and infrastructure has also resulted in a strong technical understanding across the board in regards to acoustics and vibration.

QUALIFICATIONS

BEHons (Mechanical), 2010, University of Sydney

AFFILIATIONS

Member of Australian Acoustical Society (MAAS)

KEY PROJECT EXPERIENCE

- Tweed Valley Hospital
- HammondCare Scone Stage 2
- Bowral Residential Aged Care
- Kincumber Residential Aged Care
- Mt Martha Residential Aged Care
- Caroline Springs Residential Aged Care
- Tuggeranong Office Park
- Darling Square Precinct
- Leichhardt Green, Leichhardt
- Park Sydney, Ashmore
- RAAF Williamtown Stage 2
- Liverpool Hospital & Academic Precinct
- HammondCare SA Repat Specialist Dementia Care Unit, Daw Park
- Defence Logistics Transformation Project
- Sydney Light Rail Extension
- Wynyard Walk
- T2 Tower Barangaroo
- West Village, Parramatta
- Rhodes Community Centre
- Mezzo, 87 Bay Street, Glebe
- 444 Gardeners Road, Alexandria
- Lot 104 Lachlan's Line

APPENDIX C – COMMUNITY COMMUNICATION STRATEGY

School Infrastructure NSW

Community Communication Strategy

Newcastle High School redevelopment

(Formerly Newcastle Education Campus)

SSD-41814831

March 2024

Version	Date of Review
1.0	4/04/2024

Contents

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2. Community engagement objectives 5
3. Stakeholders 5
4. Engagement approach 8
5. Engagement Delivery Timeline 14
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Document purpose

School Infrastructure NSW (SINSW) consults and engages with communities and stakeholders throughout the development of a school project. This engagement helps to inform the design of the school project and provides an opportunity to share and address potential constraints and impacts during construction.

A Consultation Report outlining the consultation and engagement during this planning phase of the project is submitted as part of the State Significant Development (SSD) application. This Community Communications Strategy (CCS) provides an overview of how SINSW will continue to communicate and consult with the community during construction of the project.

The Newcastle High School redevelopment (formerly referred to as Newcastle Education Campus) is classified as a State Significant Development, and has been assessed by the Department of Planning, Housing and Infrastructure (DPHI). Consent was provided on Friday 12 January 2024.

To view the SSD, including the Consultation Report, visit the DPHI planning portal at www.planningportal.nsw.gov.au/major-projects/projects/newcastle-education-campus.

This CCS has been developed to Comply with condition B9 of the SSD consent:

Community Communication Strategy

B9. No later than 48 hours prior to the commencement of construction, a Community Communication Strategy must be submitted to the Planning Secretary for information. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development, and for a minimum of 12 months following the completion of construction.

The Community Communication Strategy must:

(a) identify people to be consulted during the design and construction phases;
(b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;
(c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;
(d) set out procedures and mechanisms:
  (i) through which the community can discuss or provide feedback to the Applicant;
  (ii) through which the Applicant will respond to enquiries or feedback from the community; and
  (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.
(e) include any specific requirements around traffic, noise and vibration, amenity, tree retention, heritage.

This CCS outlines SINSW's commitment to:

- Consider and manage stakeholder and community expectations as integral to the successful delivery of the project.
- Inform affected stakeholders, such as the local community or road users about construction activities.
- Enable the open and proactive management of issues and communications.

This CCS will be implemented through the construction phase of the project, and for 12 months following construction completion.

Plan review

The CCS will be revised as required to address any changes in stakeholders or the project management or complaints handling process. This will be done in close consultation with the SINSW Senior Project Director, appointed Project Management company and/or Contractor and SINSW Community Engagement Manager.

Approval

The CCS is reviewed and approved by the SINSW Senior Project Director, in close consultation with relevant members of the Department of Education's School Performance team that may include a Director Educational Leadership or school Principal. Final endorsement is provided by the SINSW Senior Manager, Community Engagement.

Table 1: List of SSD requirements and where they are addressed in this CCS

State Significant Developments SSD-41814831 **B9**	**The Community Communications Strategy addresses this in section**
a) identify people to be consulted during the design and construction phases;	▪ Section 3
b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;	▪ Section 4
c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;	▪ Section 4
d) set out procedures and mechanisms: *i. through which the community can discuss or provide feedback to the Applicant;* *ii. through which the Applicant will respond to enquiries or feedback from the community;* *iii. to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.*	▪ Section 6
e) include any specific requirements around traffic, noise and vibration, tree retention, heritage.	▪ Section 7

1. Context

The Newcastle High School redevelopment includes staged upgrades comprising of:

- demolition (Buildings B, D, E, I, J and P), relocation (Building H) and refurbishment of existing buildings A and K.
- construction of new buildings (new learning hub and multipurpose facility), covered walkways, campus green, drop-off/pick-up, waste and sporting facilities
- tree removal and landscaping
- ancillary works including public domain infrastructure.

For more information on the project, visit the project webpage on the School Infrastructure NSW website.

2. Community engagement objectives

SINSW's goal is that our school infrastructure meets the needs of a growing population and enables flexible learning and teaching. This CCS has been developed to achieve the following community engagement objectives:

a) Promote the benefits of the project

b) Build key school community stakeholder relationships and maintain goodwill with impacted communities

c) Manage community expectations and build trust by delivering on our commitments

d) Provide timely information to impacted stakeholders, schools and broader communities

e) Address and correct misinformation in the public domain

f) Reduce the risk of project delays caused by negative third party intervention

g) Leave a positive legacy in each community.

3. Stakeholders

The stakeholder list below summarises who will be informed and consulted during the construction phase via ongoing face to face meetings, communications collateral and digital engagement methods.

Table 2: Stakeholders

Stakeholders	Interest and involvement
Newcastle High School community ▪ Principal ▪ Teachers ▪ Staff ▪ Parents and carers ▪ Students ▪ Newcastle High School P&C	▪ Construction impacts and how these will be minimised ▪ Safe pedestrian and traffic access to the school ▪ Parking, drop-off and pick-up considerations ▪ Quality of infrastructure and resources upon project completion ▪ How to access the new school once completed ▪ Understanding of the timing for construction, use of the temporary school, and how students will transition from the temporary to the permanent school. ▪ Available play space for students ▪ Awareness of intake area for the new school

Stakeholders	Interest and involvement
Local community Residents and property owners of: ▪ National Park Street ▪ Parkway Avenue ▪ Smith Street ▪ Dumaresq Street	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities
Adjoining affected landowners and businesses ▪ Newcastle No. 2 Sportsground, Smith Street ▪ Newcastle and Hunter Rugby Union, Cnr Parry and Smith Streets ▪ Newcastle Netball Association, Union Street ▪ 1st Merewether Scout Hall, Smith Street ▪ Fearnley Dawes Athletic Centre, 120 Smith Street	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities ▪ Environmental impacts during construction ▪ Public domain upgrades e.g. footpaths
Local Members of Parliament: ▪ Mr (Tim) Timothy Crakanthorp MP, State Member for Newcastle ▪ Ms Sharon Claydon MP, Federal Member for Newcastle	▪ Meeting the economic, social and environmental objectives of state and federal governments ▪ Delivering increased public education capacity on time ▪ Delivering infrastructure which meets expectations ▪ Addressing local issues such as traffic, congestion and public transport solutions
Government agencies and peak bodies: ▪ Transport for NSW ▪ Fire and Rescue NSW ▪ NSW Department of Planning, Housing and Infrastructure ▪ NSW Environmental Protection Authority ▪ NSW Rural Fire Service ▪ Hunter Water ▪ NSW Heritage Council ▪ NSW Department of Premier and Cabinet	▪ Traffic and congestion on the local road system ▪ Adequate public transport options and access ▪ Ensuring new infrastructure meets standard requirements for safety and fire evacuation ▪ Ensuring the development is compliant ▪ Ensuring the development does not impact heritage items ▪ Management of any contamination
Local Council – City of Newcastle ▪ Lord Mayor, Nuatali Nelmes ▪ Councillors ▪ Chief Executive Officer, Jeremy Bath	▪ Schedule for construction and opening of school ▪ Impacts to the local community including noise, congestion and traffic ▪ Shared use of community spaces ▪ Providing amenities to meet increase population density ▪ Copies of information distributed to local residents ▪ Processes and protocols in place to manage

Stakeholders	Interest and involvement
	interactions with local residents
Nearby public schools ▪ Newcastle High School (Cooks Hill campus) ▪ Newcastle East Public School ▪ The Junction Public School ▪ Hamilton South Public School ▪ Merewether Public School ▪ Hamilton Public School	▪ Impact on school resources ▪ Impact on current students ▪ Implications for teaching staff ▪ Possible impacts on enrolments ▪ Opportunities to view the new facilities
Community groups ▪ Newcastle Boys High School Old Boys Association ▪ From Central to Hunter Ex-Students' Association ▪ Newcastle Girls High School Ex-Students Union	▪ Construction impacts and how these will be minimised ▪ Impacts of project on existing infrastructure and public transport capacity ▪ Impacts of project on school heritage and history ▪ Quality of infrastructure and resources upon project completion ▪ How to access the new school once completed ▪ Understanding of the timing for construction ▪ Available play space for students ▪ Awareness of intake area for the new school/changes to intake area for upgrades
Project Status Update Group (names not disclosed) • Project members • School Principal • Director Educational Leadership	• Construction progress • Operational impacts from construction schedule
Registered/Interested Aboriginal Parties • Awabakal Local Aboriginal Land Council • Aboriginal Education Consultative Group • Muloombinbah Local Aboriginal Education Consultative Group • Registered Aboriginal Parties • Members of the local Aboriginal community including Mrs Barbara Greentree, Luke Russell, Cherie Johnson, Dominic Dates, Callan Nickerson, Aunty Belinda Wright, Amy Lalic, Nathan Towney and Madison Piercy.	• Walk on Country, design discussion and Smoking Ceremony prior to the sod turn • Recognition and respect for Aboriginal heritage and culture

4. Engagement approach

The key consideration in delivering successful outcomes for this project is to make it as easy as possible for anyone with an interest to find out what is going on. In practice, the communications approach across all levels of engagement will involve:

a) Using uncomplicated language

b) Taking an energetic approach to engagement

c) Encouraging and educating whenever necessary

d) Engaging broadly including with individuals and groups that fall into harder to reach categories

e) Providing a range of opportunities and methods for engagement

f) Being transparent

g) Explaining the objectives and outcomes of planning and engagement processes.

In addition to engagement with government departments, agencies and Council, community engagement will continue for the project during construction in two streams:

a) School-centric involvement from school communities (including students, parents/caregivers, teachers, administration staff) unencumbered by broader community issues, and

b) Broad community involvement unencumbered by school community wants and needs. Broad community stakeholders include local residents, neighbours and local action groups.

4.1. General community input

Members of the general public impacted by the construction phase are able to enquire, provide feedback and complain about environmental impacts via the following channels:

a) School Infrastructure NSW 1300 community information line (1300 482 651) that is published on all communications material, including project site signage

b) School Infrastructure NSW email address (schoolinfrastructure@det.nsw.edu.au) that is published on all communications material, including project site signage

c) Project webpage 'contact us' form

d) During information booths and information sessions held at the school or local community meeting place, and advertised on our website and via letterbox drops.

Refer to Section 6.5 of this document for detail on our enquiries and complaints process. The contractor contact details for after hours complaints and enquiries are available in the Construction Environment Management Plan which can be found in the Reports section in the project webpage library.

A number of tools and techniques will be used to keep stakeholders and the local community involved as summarised in Table 3 below.

For reference, project high level milestones during the delivery phase include:

a) Site establishment

b) Commencement of main works construction

c) School Term prior to project completion

d) Project completion

e) First day of school following project completion / official opening

Table 3: School Infrastructure NSW Communications Tools

Communications Tool	Description of Activity	Frequency
1300 community information line	The free call 1300 482 651 number is published on all communication materials and is manned by SINSW. All enquiries that are received are referred to the appointed Community Engagement Manager and/or Senior Project Director as required and logged in our CRM. Once resolved, a summary of the conversation is updated in the CRM.	Throughout the life of the project and accessible for 12 months post completion
Advertising (print)	Advertising in local newspapers may be undertaken prior to significant construction activities, major disruptions and opportunities to meet the project team or find out more at a face to face event.	At project milestones
Call centre scripts	High level, project overview information may be provided to external organisations who may receive telephone calls enquiring about the project, most namely stakeholder councils.	Throughout the project when specific events occur or issues are raised by stakeholders
Community contact cards	These are business card size with all the SINSW contact information. The project team / contractors are instructed to hand out contact cards to stakeholders and community members enquiring about the project. Cards are offered to school administration offices as appropriate. Directs all enquiries, comments and complaints through to our 1300 number and School Infrastruture NSW email address.	Throughout the life of the project and available 12 months post completion
CRM database	All projects are created in SINSW's Customer Relationship Management system at project inception. Interactions, decisions and feedback from stakeholders are captured, and monthly reports generated. Any enquiries and complaints are to be raised in the CRM and immediately notified to the Senior Project Director, Project Director and Community Engagement Manager.	Throughout the life of the project and updated for 12 months post completion
Display boards	A0/A1 size full colour information boards to use at info sessions or to be permanently displayed in appropriate places (school admin office for example).	As required
Door knocks	Provide timely notification to nearby residents of upcoming construction works, major impacts such as changes to pedestrian movements, temporary bus stops, expected impacts and proposed mitigation. Provide written information of construction activity and contact details.	As required prior to periods of significant construction impacts
FAQs	Set of internally approved answers provided in response to frequently asked questions. Used as part of relevant stakeholder	Throughout the life of the project

Communications Tool	Description of Activity	Frequency
	and community communication tools. These are updated as required, and included on the website if appropriate.	
Information booths	Information booths are held locally and staffed by a project team member to answer any questions, concerns or complaints on the project. Information booths may be held both at the school/ neighbouring school, as well as for the broader community: a) School information booths are held at school locations at times that suit parents and caregivers, with frequency to be aligned with project milestones and as required. b) Community information booths are usually held at local shopping centres, community centres and places that are easily accessed by the community. They are held at convenient times, such as out of work hours on weekdays and Saturdays. Collateral to be provided include community contact cards, latest project notification or update, with internal FAQs prepared. All liaison to be summarised and loaded in the CRM.	At project milestones and as required
Community information sessions	Information sessions are a bigger event than an info booth, held at a key milestone or contentious period. We have more information on the project available on display boards / screens and an information pack handout – including project scope, planning approvals, any impacts on the school community or residents, project timeline, FAQs. Members from the project and communications team will be available to answer questions about the project. These events occur after school hours on a week day. All liaison summarised and loaded on the CRM.	As required
Information pack	A 4 page A4 colour, fold out flyer that can include information about the project scope, progress, FAQs, timeline and next steps. To be distributed at info sessions or at other bigger events / milestones in hard copy and also made available electronically.	As required
Media releases/events	Media releases are distributed upon media milestones. They promote major project milestones and activities and generate broader community awareness.	Media milestones during construction period may include: a) Planning approval granted b) Construction contract tendered c) Construction contract awarded d) Sod turning opportunity e) Handover / Official

Communications Tool	Description of Activity	Frequency
		opening
Notifications and updates	A4 printed in colour that can include FAQs if required. Notifications are distributed under varying templates with different headings to suit different purposes: a) **Works notification** are used to communicate specific information/ impacts about works, impacts and mitigations. b) **Project update** is used when communicating milestones and higher level information to the wider community i.e. project announcement, concept design, DA lodgement, construction award, completion. Includes the project summary, information booths / sessions if scheduled, progress summary and contact information.	As required according to the construction program. Distributed (refer construction works notification distribution methodology in Section 4.2) via letterbox drop to local residents and via the school community prior to construction activities or other milestones throughout the life of the project. Specific timings indicated in table 5.
Photography and videography	Images may be used in notifications, on the website, at information sessions and in presentations. Once the project is complete, SINSW will organise photography of external and internal spaces to be used for a range of communications purposes.	Project completion (actual photography and video of completed project). Prior to project completion - artist impressions, flythrough, site plans and contruction progress images may be used.
Presentations	Details project information for presentations to stakeholder and community groups.	As required
Priority correspondence	Ministerial (and other) correspondence that is subject to strict response timeframes. Includes correspondence to the Premier, Minister, SINSW and other key stakeholders. SINSW is responsible for drafting responses as requested within the required timeframes.	As required
Project Reference Group	SINSW facilitated Project Reference Group sessions providing information on the design, construction activities, project timeframes, key issues and communication and engagement strategies.	Meets every school term or as required.
Project Status Update Group	The Project Status Update Group (PSUG) commences once construction begins and during Schematic Design. It is a forum for project teams to communicate changes from previous design phases. Its primary purpose is the sharing of information between the project team and school regarding operational impacts from the construction schedule.	Meets in week 6 of every school term once construction has commenced to allow for planning of the following school term

Communications Tool	Description of Activity	Frequency
Project signage	A0/A1 sized, durable aluminium signage will be installed at a suitable location on the construction site fencing. Provides high level information including project scope, project image and SINSW contact information.	Throughout the life of the project and installed for 12 months post completion
Site visits	Demonstrate project works and progress and facilitate a maintained level of interest in the project. Includes media visits to promote the reporting of construction progress.	As required
School Infrastructure NSW email address	Provide stakeholders and the community an email address linking direct to the Community Engagement team. Email address (schoolinfrastructure@det.nsw.edu.au) is published on all communications materials.	Throughout the life of the project
School Infrastructure NSW website	A dedicated project page for Newcastle High School redevelopment is located on the SINSW website – https://www.schoolinfrastructure.nsw.gov.au/projects/n/newcastle-high-school-revdevelopment.html	Updated at least monthly and is live for at least 12 months post completion of the project
Welcome pack/ thank you pack	At project completion the following flyers are utilised: ▪ **Welcome pack** – project completion for school community provided on the first day/week they are returning to school when new facilities are opening, or attending a new school. Includes project overview, map outlining access to the school and key locations, FAQs, contact information. ▪ **Thank you pack** – tailored to the local residents to thank them for their patience and support of the project.	Project completion only

4.2. Construction works notification distribution methodology

Construction works notifications will be distributed to targeted properties in the vicinity of the project. These properties have been identified as part of the technical studies and plans submitted as part of the planning and assessment approval pathway and post approval requirements. Specifically, the notification distribution map at **Figure 1** below has been prepared through an analysis of the potential project impacts and requirements identified in:

- the Noise and Vibration Impact Assessment submitted with the SSD application
- the Traffic Impact Assessment submitted with the SSD application
- the Construction Worker Transportation Strategy
- the Construction Environmental Management Plan, including the:
    - Construction Noise and Vibration Management Sub Plan
    - Construction Traffic and Pedestrian Management Sub Plan.

This methodology has been used to identify the anticipated construction impacts identified for this project. It does not include an arbitrary distribution area due to the robust impact analysis that has been carried out during planning and assessment phase of the project.

The distribution area may be altered:

- to address specific construction activities where the impact/s affect fewer or greater properties, depending on the nature of the work
- where ongoing monitoring shows more widespread impacts to that predicted in the environmental impact assessment
- if complaints are received outside of the distribution area
- if there is an approved project modification in the future that results in more widespread impacts

- at the discretion of School Infrastructure NSW.

Additional project updates and notifications will also be distributed when communicating milestones and higher-level information to the wider community such as construction contract award and project completion. Such updates and notifications may not detail construction impacts and may be distributed to a greater number of addresses to widely publicise the project's achievements.

The below details the nearest sensitive receivers that may be impacted by construction including noise. The properties within all shaded areas including the school will receive notifications for unplanned out of hours works before undertaking the activities or as soon as is practical afterwards. This will also consider residents that may be impacted by heavy vehicle movements and other non site specific impacts (e.g. truck movements).

Figure 1: Map of construction works with notification distribution areas enclosed

Figure 2: Map of vehicle movements

Vehicle routes including National Park Street and Smith Street.

5. Engagement Delivery Timeline

The following engagement delivery timeline maps tailored communications tools and activities by key milestone.

Table 4: Engagement timeline

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
Prior to SSD approval – consultation during planning and design development	All local stakeholders and residents	Consultation Report submitted as part of SSD	Completed
SSD approval – consult community on construction mitigation measures	Local residents	Works notification Distributed through letter box drop	Completed
Site Establishment	Local community, including across the new high school intake area High school community, including principal, teachers, staff, and P&C Adjoining property owners Local Council Member for Newcastle Aboriginal Elders	Project Update, Works Notifications, and Project signage. Distributed through letter box drop, school newsletter and social media. Onsite sod turn event, smoking ceremony	Completed
Main Construction works including but not limited to: a) Remediation (if occurs) b) Works commenced c) Key impact periods – noise, dust, traffic, vibration	Local community, including across the new high school intake area Newcastle High School community, including principal, teachers, staff, P&C and parents/carers Adjoining property owners	Works Notifications, and Project signage. Distributed through letter box drop, school newsletter and social media. Information booth if deemed required.	Throughout construction
Term prior to project completion	Local community, including across the new high school intake area Newcastle High School community, including principal, teachers, staff, and P&C Adjoining property owners Local Council	Project Update, Media Release Distributed through letter box drop, school newsletter and social media Information session, site tours if required by school leadersip.	TBC

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
	PSA and NSW Teachers' Federation		
Handover [and welcome to new school facilities]	Local community, including across the new high school intake area Adjoining property owners Local Council	Project Update, media release Distributed through letter box drop, school newsletter and social media	TBC
Opening of new high school facilities /Completion of project	Local community, including across the new high school intake area New high school community, including principal, teachers, staff, and P&C Newcastle High School community including students, teachers, staff, and parents/carers Adjoining property owners Poplars management QPRC (Customer & Communication Service Manager)	Official opening ceremony, Welcome Pack, Welcome Team, media release Distributed through letter box drop, school newsletter and social media.	TBC
Post-opening, for 12 months following operation	All	Website remains live Project signage remains installed 1300 phone and email still active, and CRM still maintained for complaints and enquiries.	TBC (at least 12 months post construction completion)

6. Protocols

6.1. Media engagement

SINSW manages all media relations activities, and is responsible for:

a) Responding to all media enquiries and instigating all proactive media contact.

b) Media interviews and delegation to SINSW media spokespeople who are authorised to speak to the media on behalf of the project

c) Informing the Minister's Office and SINSW project team members and communications representatives of all media relations activities in advance and providing the opportunity to participate in events where possible.

6.2. Site visits

SINSW, in partnership with the Department of Education Schools Performance, organises and hosts guided project site tours and media briefings as required by the Minister's Office. The Project Team will ensure the required visitor site inductions are undertaken and that all required Personal Protective Equipment (PPE) is worn.

For media site visits and events, SINSW creates, or contributes to, the production of an event pack. This will include an event brief, media release, speaking notes and Q&As.

6.3. Social, online and digital media

SINSW initiates and maintains all social and online media channels. These channels may include the Department's Facebook and Twitter, and SINSW's LinkedIn and website. SINSW will also work to coordinate social media posts with the schools' social media accounts.

6.4. Stakeholder and community notification process

Notification letters or project updates will be distributed to the community and stakeholders in advance of any activity with the potential to cause impacts.

Depending on the work activity and stakeholder, notifications are primarily distributed via letterbox drop, via the school, electronically via email, as well as uploaded to the SINSW project webpage. If appropriate, notification may also be delivered in person via door knocks, or via phone call or text message, or one-on-one briefings.

Notifications will be written in plain English and will:

- outline the reason that the work is required
- outline the location, nature, and duration of the proposed works
- outline date/s of work, where practicable
- outline work hours
- include a diagram that clearly indicates the location of the works, where required
- include a 1300 community contact number, project email address and website details
- Provide details for a translation service, where required.

Table 5 below outlines minimum notification periods that will be targeted for work activities with the potential to impact sensitive receivers. All notification periods prescribed within development approvals or by approving bodies will be adhered to.

Regular construction updates regarding the general work program and significant milestones will also be provided to the school community and neighbouring properties throughout construction.

The contractor will provide SINSW with the information necessary to meet the notification requirements and target timeframes contained, where practicable.

Table 5: Target community notification periods

Notification period	Work activity
Same day (or as soon as practical)	Major incident, emergency works
	Unplanned out of hours work (notification provided to affected residents by the contractor before undertaking the works or as soon as practical)
	Unexpected hazardous material find or incident (e.g. asbestos, lead, chemical spill or other harmful material)
7 days	Start of works or site establishment
	Works outside of the site boundary
	Planned out of hours work or change to approved work hours
	Planned investigation and remediation of hazardous materials including asbestos
	Phase of high noise generating works including demolition, tree removal, rock breaking, rock hammering, piling or similar
	Major traffic or pedestrian access changes including parking impacts, detours, and road diversions/closures
	Operational changes for the school community including to school drop-off points, entry and exit points, bus stops, and play space
3 months	Major impacts to school community, including relocation to temporary school, changes to student intake area or similar

6.5. Enquiries and complaints management

SINSW manages enquiries (*called interactions in our Customer Relationship Management (CRM) software, Darzin*), and complaints in a timely and responsive manner.

Prior to project delivery, a complaint could be related to lack of community consultation, design of the project, lack of project progress, etc.

During project delivery (construction), a complaint is defined as in regards to construction impacts – *such as* – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers, other environmental impacts, unplanned or uncommunicated disruption to the school.

If a phone call, email or face-to-face complaint is received during construction, it will be acknowledged within 2 working days and logged in our CRM, actively managed, closed out and resolved by SINSW within 10 days, where practicable. Where complaints are unable to be resolved within this timeframe the complainant will be provided with regular updates regarding the complaint resolution process.

A 24-hour contact number for the project site manager will be displayed at the site and can be shared with the community as necessary for any urgent issues that need to be addressed on site, outside of business hours.

The contractor site manager contact details are available on the project webpage at page 16 of the Construction Environment Management Plan.

As per the project's planning approval conditions, a complaints register is updated monthly, or as required by the planning authority, and is publicly available on the project's webpage on the SINSW website.

If the complainant is not satisfied with SINSW's response, and they approach SINSW for rectification, the process will involve a secondary review of their complaint as per the outlined process.

Complaints will be escalated when:

- An activity generates three complaints within a 24-hour period (separate complainants).
- Any construction site receives three different complaints within a 24-hour period.
- A single complainant reports three or more complaints within a three-day period.
- A complainant threatens to escalate their issue to the media or government representative.
- The complaint was avoidable.
- The complaint relates to a compliance matter.
- The complaint relates to a community safety matter.
- The complaint relates to a property damage claim.

Complaints will be first escalated to the Senior Manager, Community and Engagement or Director of Communications for SINSW as the designated complaints handling management representatives for our projects. Further escalation will be made to the Executive Director, Office of the Chief Executive to mediate if required.

If a complaint still cannot be resolved by SINSW to the satisfaction of the complainant, we will advise them to contact the NSW Ombudsman - https://www.ombo.nsw.gov.au/complaints.

Table 6 below outlines target timeframes for responding to enquiries and complaints, through each correspondence method:

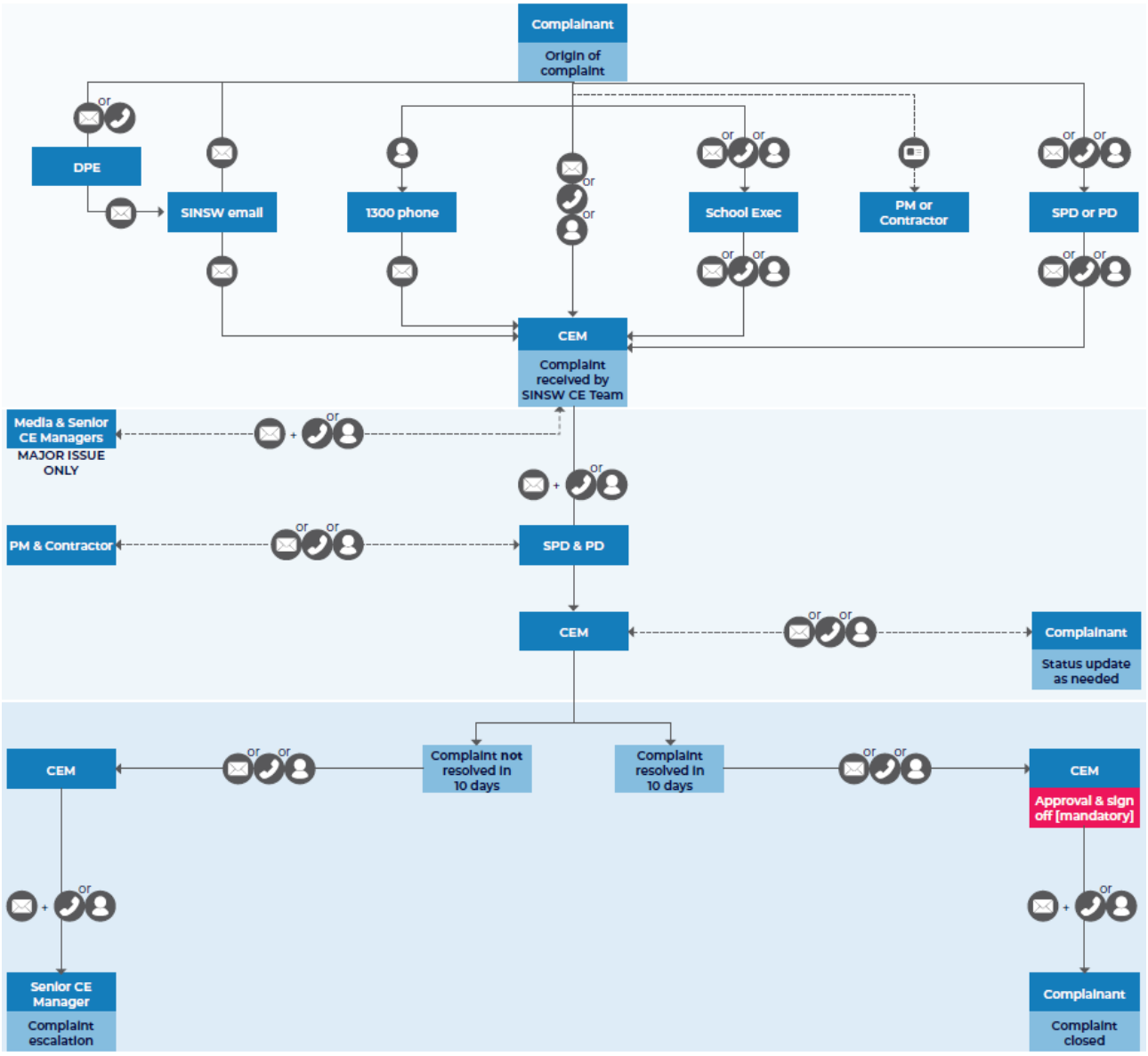
Table 6: Complaint and enquiry response time

Complaint	Acknowledgement times	Response times
Phone call during business hours	At time of call.	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Phone call after hours*	Within two (2) hours of receiving message upon returning to office.	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Email during business hours	At time of email (automatic response)	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Email outside of business hours	At time of email (automatic response)	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Interaction/ Enquiry		
Phone call during business hours	At time of call.	Interaction to be logged and closed out within 10 days, where practicable.

Complaint	Acknowledgement times	Response times
Phone call after hours	Within two (2) hours of receiving message upon returning to office.	Interaction to be logged and closed out within 10 days, where practicable.
Email during business hours	At time of email (automatic response)	Interaction to be logged and closed out within 10 days, where practicable.
Email outside of business hours	At time of email (automatic response)	Interaction to be logged and closed out within 10 days, where practicable.
Letter	N/A	Interaction to be logged and closed out within 10 days following receipt, where practicable.

The below diagram outlines our internal process for managing complaints.

Figure 3 - Internal Complaints Process



6.5.1. Disputes involving compensation and rectification

School Infrastructure NSW is committed to working with the school and broader community to address concerns as they arise. Where disputes arise that involve compensation or rectification, the process for resolving community enquiries and

complaints will be followed to investigate the dispute. Depending upon the results of the investigation, School Infrastructure NSW may seek legal advice before proceeding.

6.6. Incident management

An incident is an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. Material harm is harm that:

(a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; *or*

(b) results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment).

6.6.1. Roles and responsibilities following an incident

In the event of an incident, once emergency services are contacted (if appropriate), the incident must be immediately reported to the SINSW Senior Project Director who will inform:

a) SINSW Director

b) SINSW Community Engagement Manager

SINSW Community Engagement Manager will inform:

a) SINSW Senior Manager, Community Engagement
b) SINSW Communications Director

SINSW Communications Director will:

a) Advise the SINSW Communications Director who will lead and manage all communications with the Minister's office in the event of an incident, with assistance as required

b) Direct all communications with media to the SINSW Media Manager in the first instance for management

c) Notify all other key project stakeholders of an incident.

The SINSW Senior Project Director will issue a written incident notification to Department of Planning, Housing and Infrastructure (DPHI) Planning Secretary immediately following the incident to set out the location and nature of the incident.

This must be followed within seven days following the incident of a written notification to the Department of Planning, Housing and Infrastructure that:

(a) identifies the development and application number;

(b) provides details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);

(c) identifies how the incident was detected;

(d) identifies when SINSW became aware of the incident;

(e) identify any actual or potential non-compliance with conditions of consent;

(f) describes what immediate steps were taken in relation to the incident;

(g) identifies further action(s) that will be taken in relation to the incident; and

(h) provides the contact information for further communication regarding the incident.

Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, SINSW will provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.

The Incident Report must include:

(a) a summary of the incident;

(b) outcomes of an incident investigation, including identification of the cause of the incident;

(c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and

(d) details of any communication with other stakeholders regarding the incident.

6.7. Reporting process

Throughout the project, data will be recorded on participation levels both face to face and online, a record of engagement tools and activities carried out in addition to queries received and feedback against emerging themes.

Stakeholder and community sentiment will be evaluated throughout to ensure effectiveness of the engagement strategy and to inform future activities.

Reporting will include but not be limited to:

a) Stakeholder engagement reporting – numbers of forums, participation levels and a summary of the outcomes Community sentiment reporting – outputs of all community engagement activities, including numbers in attendance at events, participation levels and feedback received against broad themes

b) Online activity – through the project website.

7. Specific requirements

7.1. Traffic

The construction contractor has developed a Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) that details the measures that will be implemented to ensure road safety and network efficiency during construction. The CTPMSP includes the following measures:

- Site personnel will be stationed at the site entry and exit gates to ensure pedestrian safety and manage and assist construction vehicles entering to and exiting from the site.
- Road signage will be installed along surrounding streets to warn drivers approaching the site location of construction vehicles entering and exiting the site.
- Construction vehicles will radio/call the site office on approach to ensure a loading area is available within the site.
- All loading and unloading activities will be undertaken within the work site.
- Major deliveries will be scheduled to avoid the school peak drop-off and pick-up times.
- Heavy vehicle drivers will be required to adhere to the nominated transport routes.
- Drivers will be asked to leave the site in a suitable traffic gap (vehicles already on the public road have the right-of-way and must not be stopped).
- Construction workers will be encouraged and expected to use public transport to travel to/from the site. This will be incorporated in the workers induction program at the beginning of the construction period.

7.2. Noise and vibration

All works will be conducted in accordance with the project's Construction Noise and Vibration Management Sub-Plan (CNVMSP). Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

a) between 7am and 6pm, Mondays to Fridays inclusive; and

b) between 8am and 1pm, Saturdays.

No work may be carried out on Sundays or public holidays.
Provided noise levels do not exceed the existing background noise level plus 5 decibels, works may also be undertaken during the following hours:

c) between 6pm and 7pm, Mondays to Fridays

d) between 1pm and 4pm, Saturdays

Construction activities may be undertaken outside of the hours in condition C4 and C5 if required:

(e) by the Police or a public authority for the delivery of vehicles, plant or materials; or

(f) in an emergency to avoid the loss of life, damage to property or to prevent

(g) environmental harm; or

(h) where the works are inaudible at the nearest sensitive receivers; or

(i) for the delivery, set-up and removal of construction cranes, where notice of the

(j) crane-related works is provided to the Planning Secretary and affected residents at

(k) least seven days prior to the works; or

(l) by the relevant roads authority or utilities service provider in order to minimise

(m) disruption to the roadway or essential services, where the related works have been

(n) provided to the Planning Secretary and affected residents at least seven days prior

(o) to the works; or

(p) where a variation is approved in advance in writing by the Planning Secretary if appropriate justification is provided for the works.

Notification of such construction activities will be given to affected residents before undertaking the activities or as soon as is practical afterwards.

Rock breaking, rock hammering, sheet piling, pile driving and similar activities will only be carried out between the following hours:

- 9am to 12pm, Monday to Friday;
- 2pm to 5pm Monday to Friday; and
- 9am to 12pm, Saturday.

The development will be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures will be implemented and any activities that could exceed the construction noise management levels will be identified and managed in accordance with the management and mitigation measures identified in the approved CNVMSP.

7.3. Amenity

All works will be undertaken in accordance with the project's Construction Environmental Management Plan (CEMP) that details measures to manage dust and odour to protect the amenity of the neighbourhood.

All construction facilities at the site will be designed and operated to minimise the emission of smoke, dust, cement dust, plant and vehicle exhausts, and other substances into the atmosphere. Construction methods will be used that minimise air pollution.

Dust from construction works will be hosed down with water as required. Construction vehicles leaving the site will cover their loads and will be washed down to prevent tracking dust and mud from the site. Power tools will be fitted with dust collection devices where practical.

In compliance with Development condition E13, should outdoor lighting result in any residual impacts on the amenity of surrounding sensitive receivers, SINSW will provide mitigation measures in consultation with affected landowners to reduce the impacts to an acceptable level. Visual amenity impacts will be limited during construction via the installation of appropriate site fencing and adherence to site housekeeping procedures.

7.4. Flora and fauna

SINSW is committed to ensuring construction work has a minimal impact upon fauna and vegetation on site.
SINSW will comply with all Development Consent Conditions relating to the protection of fauna and vegetation and all relevant mitigation measures listed in the project's Environmental Impact Statement (EIS).

The project's CEMP details the measures to be taken for the protection and management of fauna and vegetation, and has been prepared in accordance with relevant guidelines and performance indicators.

Trees will not be trimmed or removed without appropriate statutory approval. A qualified and experienced arborist will complete all vegetation removal and trimming.

Trees and vegetation that must be preserved will be fenced-off, marked or otherwise isolated to ensure they are not inadvertently damaged as per the recommendations of the Arborist Report Rev A, dated 27 September 2023 and Addendum to Arborist Report dated 30 November 2023 and prepared by Joseph Pidutti Consulting Arborist.

Any trenching or construction works unavoidably undertaken within Tree Protection Zones will be witnessed, supervised and recorded by an AQ5 qualified arborist who will specify any works to be undertaken to avoid or remediate damage to trees.

On completion of the works, all areas disturbed by construction activities shall be restored to the contract specifications. Where required and practical, efforts will be made to mulch and re-use vegetation on site or send it to a green waste recycling facility.

7.5. Soil and water

SINSW is committed to the appropriate management of soil and water on the construction site. SINSW will comply with all Development Consent Conditions relating to soil and water management and will comply with all relevant mitigation measures listed in the Environmental Impact Statement (EIS).

The CEMP for the project includes a Construction Soil and Water Management Sub-Plan (CSWMSP) which details measures for the management of soil and water. It has been prepared in accordance with relevant guidelines and performance indicators. The CSWMSP:

- describes erosion and sediment control measures to be implemented during construction
- provides a plan of how construction works will be managed in wet-weather events
- details flows from the site to surrounding area
- describes the measures to be taken to manage stormwater and flood flows for small and large sized events.

Erosion and sediment controls will be installed and maintained in accordance with the “Blue Book” – Managing Urban Stormwater: Soils and Construction (4th edition). These controls will be implemented prior to the start of any other site disturbance works.

Care will be taken to prevent sediment run-off into neighbouring lots and stormwater systems. This includes installing silt fences to site boundaries, as required, and fixing geotextile fabric to the temporary construction fencing for any downhill boundaries. Stormwater inlets will be covered with geotextile fabric to ensure no sediment enters the system.
Vehicle access will be controlled to prevent sediment being tracked. An all-weather driveway to access the site will be maintained.

Only approved soil and imported fill types will be used onsite in accordance with the consent conditions. Accurate records will be kept on the volume and type of fill used onsite. Any collected silt will be disposed of in accordance with the relevant codes and standards.

Regular inspections, repairs and cleaning will be carried out of the silt fences to the boundaries, stockpiles, wastes enclosers and of the stockpile covers.

A.7 Construction Waste Management Sub-Plan (CWMSP)

HANSENYUNCKEN

Waste Management Plan

Project: Newcastle High School Redevelopment

Job No: SN111

Rev: 1 – Jan 2024

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Uncontrolled Document in Hard Copy

Hansen Yuncken would like to acknowledge the AWABAKAL people as the traditional custodians of the land where this project is located.

We honour elders; past, present and emerging whose knowledge and wisdom has and will ensure continuation of cultures and traditional practices.

HANSENYUNCKEN

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HANSENYUNCKEN

1 Document Information

1.1 Review and Approval

Position	Name	Sign	Date
Review			
Project Manager	Robert Petersen		
Site Manager	Chris Histon		
Contracts Administrator	Michael Pratt		
Contracts Administrator	Adam Rosandic		
Project Engineer	Jordan Watters		
Project Engineer	Giuseppe Carlomagno		
Site Engineer			
Site Supervisor			
Site Supervisor			
Cadet			
HSE Coordinator			
Approval			
Construction Manager			
HSE Manager	Pater Fay		

1.2 Document Control

Revision	Description	Issued by	Issue date
1	Revision 1	GC	15/01/2024

2 Definitions

The following definitions and abbreviations have been used in this Waste Management Plan. Further definitions and abbreviations are provided in referenced procedures and plans.

EPA	Environmental Protection Authority
HY	Hansen Yuncken
WMP	Waste Management Plan (this document)

3 Summary Response to SSD Consent Conditions

SSD Condition 17	Reference
a) the recording of quantities, classification (for materials to be removed) and validation (for materials to remain) of each type of waste generated during construction and proposed use for materials to remain;	4.1.7 Waste Quantities 4.1.14 Validation 5 Waste Management Details
b) information regarding the recycling and disposal locations;	5 Waste Management Details (Table 6)
c) confirmation of the contamination status of the development areas of the site based on the validation results.	4.1.14 Validation

4 Commitment & Policy

4.1 Purpose

To manage the construction waste including the re – use, recycle and dispose of all excavated material and other wastes generated on construction site.

This Plan has been prepared in accordance with City of Newcastle Council “Waste Management – Technical Manual”

This plan applies to the lawful disposal of construction materials on “The Project” development during the construction period.

4.2 Scope of Works

• Demolition of eight (8) buildings

• Services infrastructure upgrades

• Relocation of Building H

• Construction of a new three (3) storey learning hub on the southwestern corner of the campus, incorporating a new library, canteen, covered outdoor learning area (COLA), support learning unit, general learning spaces, hospitality teach spaces, and science labs

• Construction of a new multi-purpose facility on the north-eastern corner of the campus, incorporating a gymnasium, stage, fitness lab, flexible learning spaces, outdoor courts, and end-of-trip (EOT) facilities for staff.

• Internal refurbishment works within the administration building on Parkway Avenue to form a new student hub.

• Internal refurbishment of Building K to provide staff facilities

• New student entry from Parkway Avenue

• New sports courts, campus green and associated landscaping

4.3 Objectives

The objectives of this plan correspond with those set out in the City of Newcastle Council “Supplements Section 7.08 of the Newcastle DCP”

- Waste minimisation and resource recovery –
  - To avoid waste through design and ordering correct material quantities.
  - To encourage improved environmental outcomes through increased source separation of materials.
  - To ensure more efficient management of waste and recyclable materials.

  - To maximise reuse and recycling of building construction materials, household generated waste and industrial commercial waste.
- Access – to ensure waste systems are easy to use and that collection vehicles are able to access buildings to remove waste safely and easily;
- Safety – to ensure safe practices for storage, handling and collection of waste and recycling;
- Pollution prevention – to prevent stormwater pollution that may occur as a result of poor waste storage and management practices;
- Ecologically Sustainable Development (ESD) – to promote the principles of ESD through resource recovery and recycling leading to a reduction in the consumption of finite natural resources;
- Hygiene – to ensure health and amenity for residents, visitors and workers
- Noise minimisation – to minimise noise during use by residents and collection of waste and recyclables.

5 Construction Waste

During construction it is anticipated that a variety of waste will be generated consistent with project scope and size. The major waste streams to be expected from the project are:

- Excavation:
  - General Spoil/Fill – landfill
  - Natural Material (VENM) – Recyclable
- Construction:
  - Concrete – Recyclable
  - Plastics – Recyclable
  - Timber – Recyclable
  - Glass – Recyclable
  - Metal – Recyclable
  - Tiles – Recyclable
  - General Waste – landfill

Hansen Yuncken's goal for building waste management is primarily the reduction of waste generated during construction activities. Waste reduction is the responsibility of all trades on site, as it relates to materials procurement, handling, storage and use. Waste generated during construction will be reused (where possible), recycled or disposed to landfill.

5.1 General Waste Management Strategies

Waste management activities are to be in accordance with:

- "Hansen Yuncken" Project Environmental Management plan; and
- City of Newcastle Council "Waste Management – Technical Manual"

The main goal in construction will be to reduce the total volume of waste produced, which is to be achieved by effective materials procurement, management and supply.

"Hansen Yuncken" shall focus on minimising waste by implementing the following:

5.1.1 Reducing Organic Waste

Organic waste consists of the following:

- Pruning and clippings
- Vegetation clearance
- Tree trunks and large branches from land clearance
- Weeds, leaf litter, mulch

To counter the amount of organic waste that will be encountered, it shall be chipped, mulched, composted and reused on site or sent to an off-site compost facility wherever possible.

5.1.2 Reducing solid waste

Solid waste consists of the following:

- Packaging from site materials
- Excess materials, unused products
- Soil from excavations
- Sediment retained in sediment traps

To counter the amount of solid waste that will be encountered, HY shall endeavour to:

- Buy materials with minimum packaging.
- Not over-order.
- Stockpile and reuse it on site.
- Recycle it off site or return to the supplier

5.1.3 Reducing liquid waste

Liquid waste can consist of the following:

- Site clean up
- Wash down areas
- Brick/tile /concrete cutting waste
- Dust control waste

To counter liquid waste, HY shall only discharge clean water into the stormwater. Where possible HY shall avoid generating any dirty water and when encountered, shall attempt to use such grey water for irrigation or as a means of suppressing dust.

HY shall also ensure that any waste stored for reuse, recycling or disposal cannot be washed or blown away.

5.1.4 Waste Minimisation

Major subcontractors will be encouraged to submit waste minimisation details including the following:

- Practical measures associated with their works to prevent waste entering the site
- Waste resulting from their work which can be recycled are to be actively managed as part of their waste reduction plan
- Alternative products containing recycled materials that could be utilised in their works which conform and meet the design specification
- Ordering the right quantities of materials and prefabrication of materials where possible
- Minimising site disturbance and to limit unnecessary excavation
- Careful sourcing separation of off-cuts to facilitate re-use, resale or efficient recycling

In order to reduce waste on site during the construction stage, all HY personnel and sub-contractors will be instructed to perform the following:

- Order materials to size
- Don't over-order
- Order pre-cut or prefabricated materials (where appropriate)
- Reduce packaging at source—buy materials with minimal packaging
- Separate reusable or recyclable materials from waste
- No rubbish is to be buried or burned on sit
- A designated concrete wash down area will be established on site for concrete trucks and pumps. Such an area will be adequately signed and designed so that any excess drainage from the area will be contained within the site boundaries
- Bins to be inspected regularly

5.1.5 Site Bin System

A site waste bin system will be achieved through the use of sealed bins for putrescible waste, separate portable bins for recyclable materials and non-recyclable waste materials.

Additional bins will be provided where practical to further separate waste between different recyclable materials.

Materials collected for recycling include:

- Glass
- Concrete, bricks and tiles
- Timber
- Aluminium
- Steel and other metals
- Plastic
- Plasterboard
- Paper, cardboard

The subcontractors will be responsible for the daily cleaning of their respective work areas and for placing all their waste in the nominated waste bins.

5.1.6 Packaging

All suppliers of building materials will be encouraged to nominate packaging minimisation and reuse initiatives. Bulk handling and reusable transport containers will be encouraged.

5.1.7 Waste Quantities:

The quantity of potential waste material is estimated by:

- Quantifying materials for the project
- Applying waste margins allowed in ordering materials
- Copying these amounts of waste into the waste management plan.

Normal waste percentages applicable to our work include:

- Timber 5 - 7%
- Plasterboard 5 - 15%
- Concrete 3%
- Bricks / Blocks 5%
- Tiles 5 – 10%

Conversion to volume of waste materials:

- Timber 0.5 tonne per m^3
- Concrete 2.4 tonne per m^3
- Bricks / Blocks 1.0 tonne per m^3
- Tiles 0.75 tonne per m^3
- Steel 2- 4 tonne per m^3

5.1.8 Waste Management

Waste will be separated and / or stored onsite for re-use and recycling – where applicable.

Site operations will ensure minimal waste creation and maximum reuse and recycling by:

- Staff training
- Employment of a specialised waste Management contractor
- Recycled materials used in construction
- Waste management requirements stipulated in sub-contracts
- On-going checks by site supervisors
- Separate area or bins set aside for sorted waste
- Clear signage of waste areas.

5.1.9 Training and Consultation

Waste minimisation will be part of the site environmental awareness program that will be incorporated into the site induction program.

The responsibility to ensure that waste materials go into the correct bins will be with everyone on site.

5.1.10 Measure of Performance

A waste management contractor shall be involved in the project to ensure effective planning for waste management.

The Waste Management Contractor will coordinate waste recycling, measurement, recovery and disposal. HY shall ensure 80% or more (by mass) of all construction waste generated on this project is reused or recycled.

5.1.11 Monitoring

The Waste Management Contractor will be responsible for providing monthly reports to the Site Manager. These reports will measure the number and size of bins, waste type in each bin, total tonnage / cubic metres generated and total tonnage / cubic metres recycled.

Waste reports will be collated and uploaded onto HYway via BIM360 Field monthly waste reports. Cumulative summaries of generated waste and recycling statistics are readily available and auditable.

Regular project audits shall be conducted to ensure their compliance with this plan, standards, City of Newcastle requirements and the contract.

5.1.12 Corrective Actions

Where a subcontractor has caused a bin to be contaminated unduly, the Site Manager will be advised, by a non-conformance report procedure. All corrective actions taken by the subcontractor shall be monitored and recorded against the non-conformance procedure, all of which shall be at the cost of the offending subcontractor.

5.1.13 Disposal

Dispose of waste to landfill will be as a last resort only. Landfill sites or waste transfer stations will require correct handling for dusty or hazardous waste and offer discounts for sorted wastes such as brick, metal and timber.

Records of disposals shall be kept on site. Any disposal of waste that is deemed hazardous shall be disposed of by approved EPA hazardous disposal unit

5.1.14 Validation

The Remediation Contractor must be aware of and conduct all waste disposal in accordance with all relevant regulations. All waste tracking documentation including disposal dockets must be maintained by the Remediation Contractor and must be provided to the Site Contamination (Environmental) Consultant and the client for inclusion in the validation report.

Validation data is required to be collected to verify the effectiveness of the remedial works and document the final site conditions as being suitable for the proposed future use(s). Validation activities will be required for tracking the movement of waste materials requiring off-site disposal.

6 Waste Management Details

Table 3: Demolition Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Appx. Percentage Recovered
Bricks	1312	1574.4	100%
Tiles	24.04	24.04	100%
Concrete	2372	3558	100%
Timber	238.2	45.258	33%
Plasterboard	122.98	24.596	50%
Metals	269	134.5	100%
Asbestos	128.4	39.804	0%
Other waste	345.5	103.65	30%
Totals	**4812.12**	**5504.248**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <hiips://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled demolition waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

Table 4: Demolition Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Bricks	☐	1574.4	☐	☒	☐	1574.4
Tiles	☐	24.04	☐	☒	☐	24.0
Concrete	☐	3558	☐	☒	☐	3558.0
Timber	☐	45.258	☐	☒	☒	14.9
Plasterboard	☐	24.596	☐	☒	☒	12.3
Metals	☐	134.5	☐	☒	☐	134.5
Asbestos	☐	39.804	☐	☐	☒	0.0
Other Waste	☐	103.65	☐	☒	☒	31.1
Total		**5504.248**	**Total**			**5349.3**
Total Diversion of Waste from Landfill (Minimum 80%)						**97.2%**

Table 5: Construction Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Approx. Percentage Recovered
Excavation Material	911	911	99.8%
Bricks	40.4	48.5	100%
Tiles	1.1355	1.1	100%
Concrete	248.4	372.6	100%
Timber	0	0.0	33%
Plasterboard	594	118.8	50%
Metals	297	17.1	100%
Other Materials	136.65	40.995	30%
Totals	**2228.586**	**1510.1**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <hiips://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

Table 6: Construction Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Excavation Material	☐	911	☐	☒	☒	908.7225
Bricks	☐	48.5	☐	☒	☐	48.5
Tiles	☒	1.1	☐	☒	☐	1.1
Concrete	☐	372.6	☐	☒	☐	372.6
Plasterboard	☐	118.8	☐	☐	☒	59.4
Metals	☐	17.1	☐	☒	☐	17.1
Other	☐	40.995	☐	☒	☒	12.2985
	Total	**1510.1**			**Total**	**1419.7**
					Total Diversion of Waste from Landfill (Minimum 80%)	**94%**

	Business Name	Suburb	Distance (km)
Excavation Material	Benedict Recycling	Mayfield West	6 km
	Summerhill Waste Management	Mallsend	11.6km
	Bingo Recycling Centre	Tomago	12.7km
Green waste	Benedict Recycling	Mayfield West	6 km
	Summerhill Waste Management	Mallsend	11.6km
	Awaba Waste Management Facility	Awaba	22.8km
Bricks	SCE Recycling	Mayfield	4.1 km
	Boral Recycling	Kooragang	5.3 km
	Benedict Recycling	Mayfield West	6 km
Tiles	SCE Recycling	Mayfield	4.1 km
	Boral Recycling	Kooragang	5.3 km
	Benedict Recycling	Mayfield West	6 km
Concrete	SCE Recycling	Mayfield	4.1 km
	Boral Recycling	Kooragang	5.3 km
	Benedict Recycling	Mayfield West	6 km
Timber	Benedict Recycling	Mayfield West	6 km
	Summerhill Waste Management	Mallsend	11.6km
	Bingo Recycling Centre	Tomago	12.7km
Plasterboard	Benedict Recycling	Mayfield West	6 km
	Bingo Recycling Centre	Tomago	12.7km
Metals	InfraBuild Recycling	Hexham	10.5km
	Bingo Recycling Centre	Tomago	12.7km

A.8 Construction Soil and Water Management Sub-Plan (CSWMSP)

The Forum, Suite 1, Level 1

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Charlestown NSW 2290

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Construction Soil and Water Management Plan

Newcastle High School Redevelopment

Prepared for: Hansen Yunken

Document no:NA230761 R03

Revision no: 003

ACOR Consultants Pty Ltd (ACN 079 306 246) (ABN 40 079 306 246)

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Revisions

Revision	Description	Date	Prepared by	Approved by
01	CC1	26.03.2024	J Rhodes	U Knight
02	CC1 – updated plans	28.03.2024	J Rhodes	U Knight
03	Compliance table added	5.04.2024	J Rhodes	U Knight

Review Panel

Division/ office	Name
Newcastle	U.Knight

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1 SSD Compliance

SSD Condition Number	Requirement	Report Reference
B18	The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following:	
	a) be prepared by a suitably qualified expert, in consultation with Council;	The plan was developed by Josh Rhodes and reviewed by Ulrika Knight who are both CPEng and NER Civil Engineers with over 20 years of experience developing sediment and erosion control plans for developments. CVs for Josh and Ulrika are attached in Appendix D. The plans have been developed generally in accordance with the plans provided for DA that were approved by the City of Newcastle Refer to council approval letter attached
	b) measures to ensure that sediment and other materials are not tracked onto the roadway	Refer to section 4 of this report and the attached plans in Appendix A
	c) describe all erosion and sediment controls to be implemented during construction, including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book';	Refer to section 4 of this report and the attached plans in Appendix A
	d) include an Acid Sulfate Soils Management Plan, if required, including measures for the management, handling, treatment and disposal of acid sulfate soils, including monitoring of water quality at acid sulfate soils treatment areas	Refer to section 5 of this report and the attached plans in Appendix C

SSD Condition Number	Requirement	Report Reference
	e) provide a plan of how all construction works will be managed in a wet-weather event (i.e. storage of equipment, stabilisation of the site);	Refer to section 4 of this report and the attached plans in Appendix A
	f) detail all off-site flows from the site; and	Refer to section 4 of this report and the attached plans in Appendix A
	g) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 5-year ARI and 1 in 100-year ARI.	Refer to section 4 of this report and the attached plans in Appendix A

2 Introduction

2.1 Project Description

Hansen Yunken engaged ACOR Consultants to undertake the civil design for the Newcastle High School Redevelopment Project located at 25A National Park Street, Newcastle West. Part of the scope of the civil scope is the preparation of a Construction Soil and Water Management Plan.

3 Development

3.1 Proposed Development

The redevelopment works consist of the demolition of several existing buildings on site, construction of a three storey Library/Learning Hub, a Multi-Purpose Facility, the relocation of a building as well as associated pathways and landscaping. Figure 1 shows the proposed redevelopment works.

3.2 Earthworks

The construction works on site will include significant site regrading. Figure 2 shows the extent of the earthworks cut and fill for the development.

4 Construction Soil and Water Management Plan

4.1 General

During the construction phase of the development, a Construction Soil and Water Management Plan (CSWMP) will be implemented to minimise water quality impacts. The CSWMP has been prepared in accordance with "Managing Urban Stormwater – Soils and Construction" by Landcom. This document is the industry standard for the management of stormwater runoff during construction in NSW. The control measures for the works include a sediment basin, sediment fences, cut-off drains for polluted stormwater, gully pit sediment barriers, field inlet sediment traps and temporary infiltration tank protection.

Details of the required construction phase control measures are provided on the detailed engineering drawings in accordance with the required standards. The contractor is responsible for the provision of the construction phase water quality infrastructure implementation and maintenance onsite. The erosion and sediment controls will continuously change throughout the construction phase. The contractor will minimise the amount of disturbed areas throughout the construction program. Where possible, catchments will be limited to below 2500m² to avoid the construction of unnecessarily large sediment basins. The erosion and sediment control plans, construction notes and details are shown in Appendix A.

The following information is provided to identify controls and procedures required to be incorporated into the Erosion and Sediment Control Program and responsible parties.

4.2 Pre-Construction

- Establish a single stabilised entry/exit point for each stage of construction. This point should also include a vehicle shakedown device to mitigate the transportation of dust and dirt.
- Sediment fences are to be placed along the low side of the site to slow flows, reduce scour and capture some sediment runoff.
- Sediment fences are to be constructed at the base of fill embankments.
- Divert up-slope water around the work site and appropriately stabilise any drainage channels.
- Areas for plant and construction material storage are to be designated along with associated diversion drains and spillage holding ponds.
- Diversion banks are to be created at the upstream boundary of construction activities to ensure upstream runoff is diverted around any areas to be exposed. Catch drains are to be created at the downstream boundary of construction activities.
- Construction of a temporary sediment basin shall be constructed along with dirty water channels to direct runoff from the disturbed areas to the basin for treatment prior to discharge to the downstream stormwater network. Sizing of the proposed sediment basin has been undertaken using the design spread in accordance with “Managing Urban Stormwater: Soils and Construction”. The sediment basin was sized for a Type C soil which is consistent with the sand subgrade on site.

  The proposed location of the sediment basin will be the northeast corner of the site. The maximum disturbed area draining to this basin will be approximately 6,500m^2. All other disturbed areas onsite will be limited to below 2,500m^2. If greater areas are disturbed on site during construction, the requirements for the sediment basin size will need to be updated.

  Calculations showing the size of the sediment basin for a disturbed area of 6,500m² are shown in Appendix B.
- Site personnel are to be educated to the sediment and erosion control measures implemented on site and maintenance requirements.

4.3 During Construction

- Progressive stabilization of filled areas and fill batters.
- Construction activities are to be confined to the necessary construction areas.
- The provision of a construction entry/exit to prevent the tracking of debris from tyres of vehicles onto public roads and to limit the movement of construction equipment.
- The topsoil stockpile location will be nominated to coincide with areas previously disturbed. A sediment fence is to be constructed around the bottom of the stockpile to trap sediment. A diversion drain is to be installed upstream of the stockpile if required.

- Roof downpipes should be installed as soon as practicable after the roof is constructed.
- Transport loads that are subject to loss through wind or spillage shall be covered or sealed to prevent entry of pollutants to the stormwater system.
- Regular inspection and maintenance of sediment fences, sediment basin and other erosion control measures. Following rainfall events greater than 50mm, an inspection of erosion control measures and removal of collected material should be undertaken. Replacement of any damaged equipment should be performed immediately.

4.4 Post Construction

- The Contractor/ Developer will be responsible for the maintenance of erosion and sediment control devices from the possession of the site until stabilisation has occurred to the satisfaction of the superintendent and Principal.
- The Erosion and Sediment Control Management Plans should be provided to all people involved with the site, including sub-contractors, private certifiers, body corporates and regulators.

4.5 Monitoring and Maintenance

Regular maintenance of the erosion and sediment control facilities is required through the construction phase of the project. Table 1 outlines the treatment measures and the frequency of maintenance for each.

Table 1: Frequency of maintenance for treatment measures

Treatment Measure	Maintenance Frequency	Description
Sediment Fence	Weekly inspections and following rainfall events to check for signs of sediment build up, erosion or weak points	Remove sediment build up. Reinforce weak points. Maintain alignment.
Pit Sediment Traps	Weekly inspections and following rainfall events to check for signs of sediment build up, broken filters and sediment in the pit.	Remove sediment and debris build up from around the pit or inside the pit. Repair or replace any damaged pit filters
Sediment Basins	Following significant rainfall events up to 50mm/day.	Review sediment buildup at the base as well as at the inlet and outlet structures. Maintain sediment storage zone volume from the design. Remove built up sediment.
Diversion Drains	Weekly inspections and following rainfall events to check for signs of sediment build up, erosion or weak points	Remove sediment build up.

5 Acid Sulphate Management

An investigation into the presence of Acid Sulphate Soil (ASS) or Potential Acid Sulphate Soil (PASS) on site was undertaken as part of the original geotechnical investigation by Martins and reviewed in a further investigation by Douglas Partners. Testing of soils indicated that those above 8.3m depth (at approximate 4.3m AHD) were not ASS or PASS soils. As all works proposed are above this level, an Acid Sulphate Management Plan is not required for the site. Refer to Appendix C for the Douglas Partners report confirming the above.

6 Conclusion

The above report details the requirements of the Construction Soil and Water Management Plan for the Redevelopment of Newcastle High School project. The report covers the required erosion and sediment control infrastructure, the maintenance frequency, and requirements for the proposed development.

Yours faithfully,
ACOR Consultants Pty Ltd

Josh Rhodes
National Civil Leader, Principal Civil Engineer

Appendix A Erosion and Sediment Control Plans

LEGEND

- DESIGN BOXOUT CONTOURS 0.5m INTERVALS
- DESIGN BOXOUT CONTOURS 0.1m INTERVALS
- SEDIMENT FENCE TO SD 6-8
- MESH AND GRAVEL INLET FILTER TO SD 6-11
- GEOTEXTILE INLET FILTER TO SD 6-12
- STABILISED SITE ACCESS TO SD 6-14
- CONCRETE WASHBAY
- MATERIAL STOCKPILE (LOCATION TO BE CONFIRMED ON SITE)
- DIRTY WATER DIVERSION SWALE
- NO GO ZONE TO PROTECT AND RETAIN EXISTING TREES

NATIONAL PARK STREET

ADJOINS C103-0002

BLOCK G

BLOCK M

BLOCK C

TREES TO BE RETAINED

INDICATIVE LOCATION OF STABILISED SITE ACCESS

ADJOINS C103-0003

ADJOINS C103-0003

ADJOINS C103-0002

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Issue	Description	Date	Drawn	Approved
B	ISSUED FOR PRELIMINARY REVIEW	28.03.24	MDM	JPR
A	ISSUED FOR PRELIMINARY REVIEW	19.03.24	MDM	JPR

North

Scale: SCALE BAR 1:250 @A1 1:500 @A3 (0, 2.5, 5, 10, 15m)

PRINT IN COLOUR

Client: SCHOOL INFRASTRUCTURE NSW
8/259 GEORGE STREET, SYDNEY NSW 2000
T: 1300 482 651

NSW GOVERNMENT

Architect: EJE ARCHITECTURE
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Suite 1 240-244 Pacific Highway
Charlestown NSW 2290
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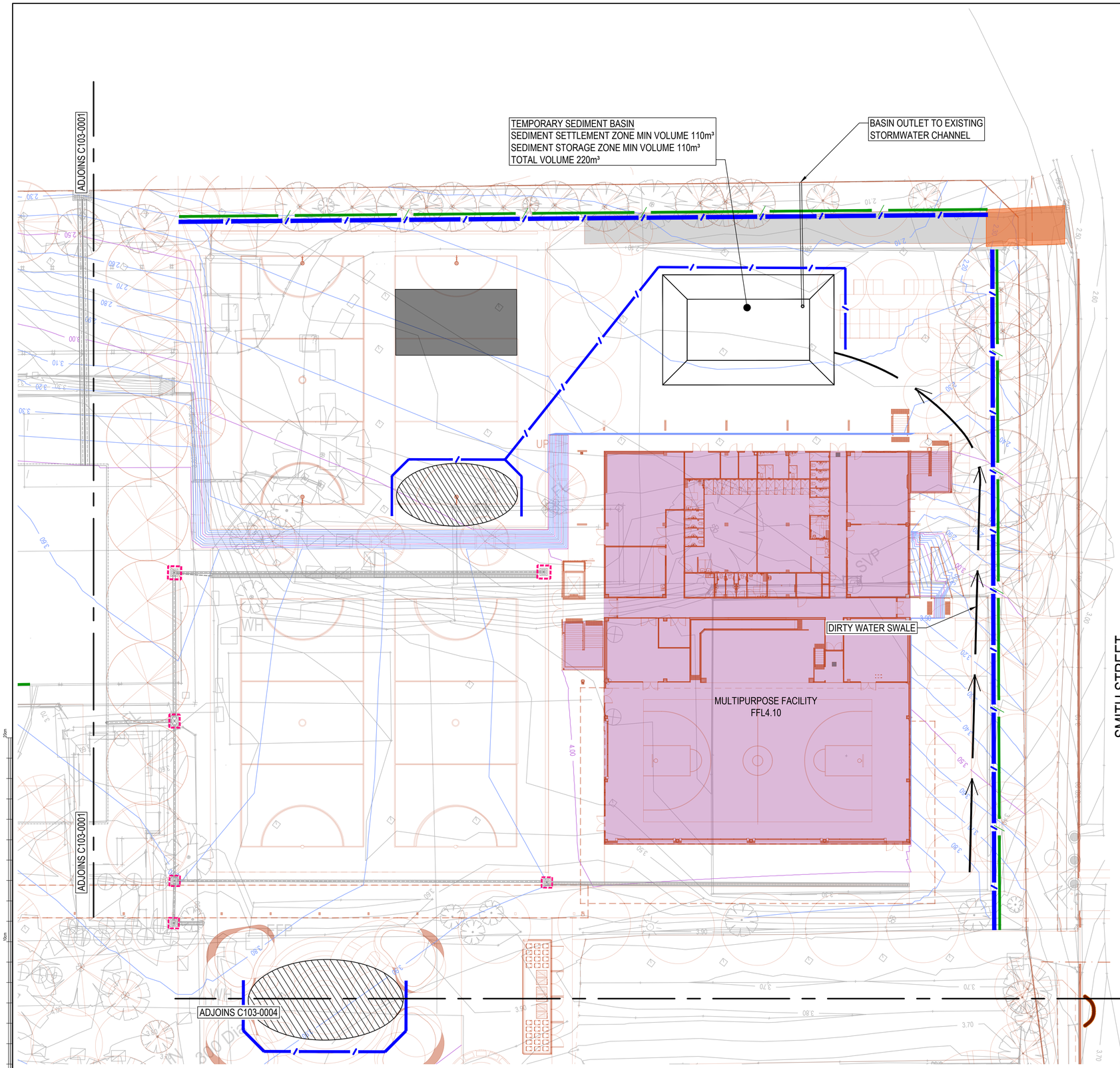
Project: NEWCASTLE HIGH SCHOOL REDEVELOPMENT
CONSTRUCTION CERTIFICATE 1 - EARLY WORKS
25A NATIONAL PARK STREET
NEWCASTLE WEST NSW 2302

Drawing Title: CIVIL SERVICES
EROSION AND SEDIMENT CONTROL PLAN
SHEET 1

Drawn	Designed	Q.A. Check	Date	Scale @ A1
MDM	JK	JPR	28.03.24	1:250

Project No.	Drawing No.	Issue
NS230761	C103-0001	B

Mar 28, 2024 - 3:50pm



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SHEET 2

Drawn	Designed	Q.A. Check	Date	Scale @ A1
MDM	JK	JPR	28.03.24	1:250

Project No.	Drawing No.	Issue
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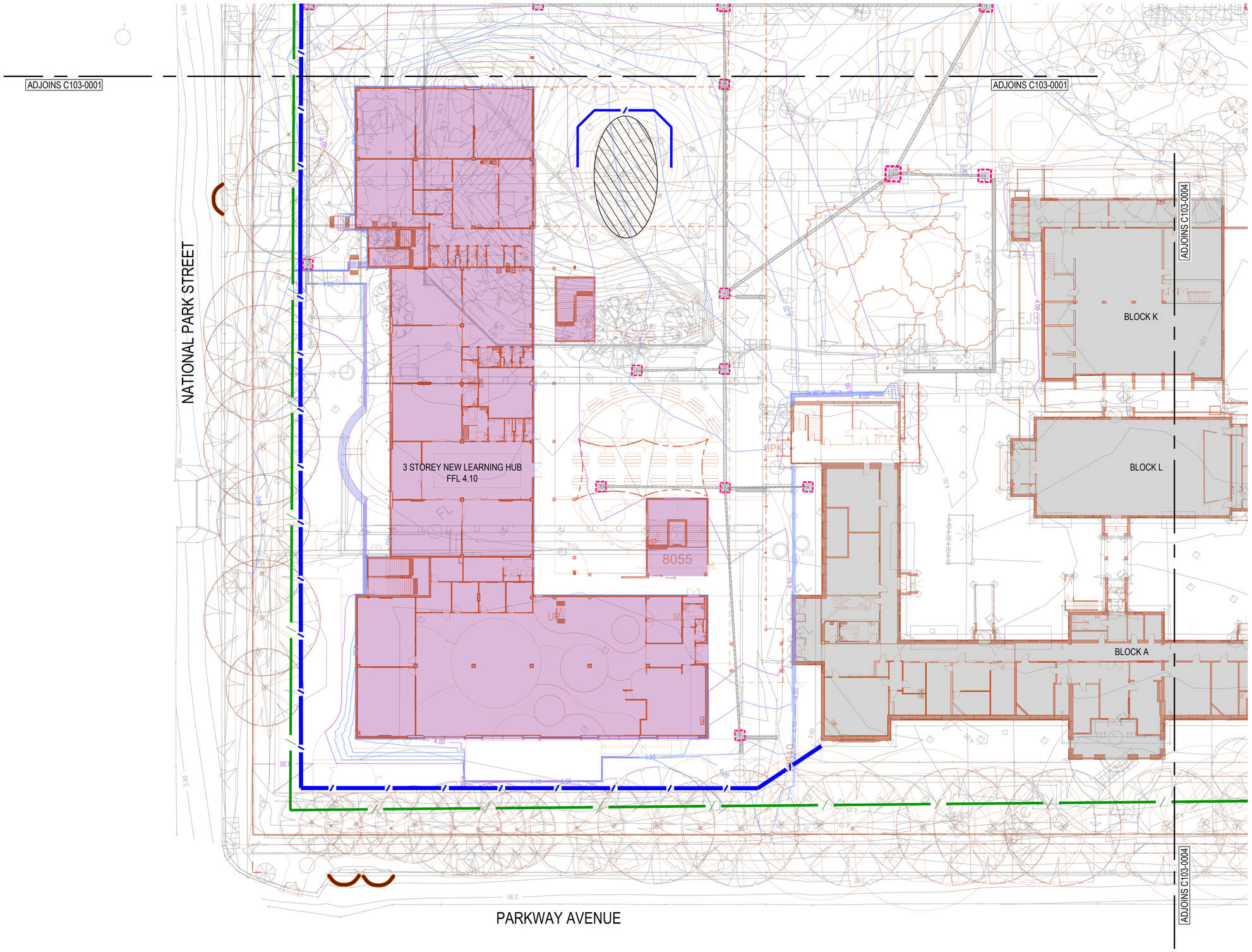

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Drawing Title: CIVIL SERVICES
EROSION AND SEDIMENT CONTROL PLAN
SHEET 3

Drawn	Designed	Q.A. Check	Date	Scale @ A1
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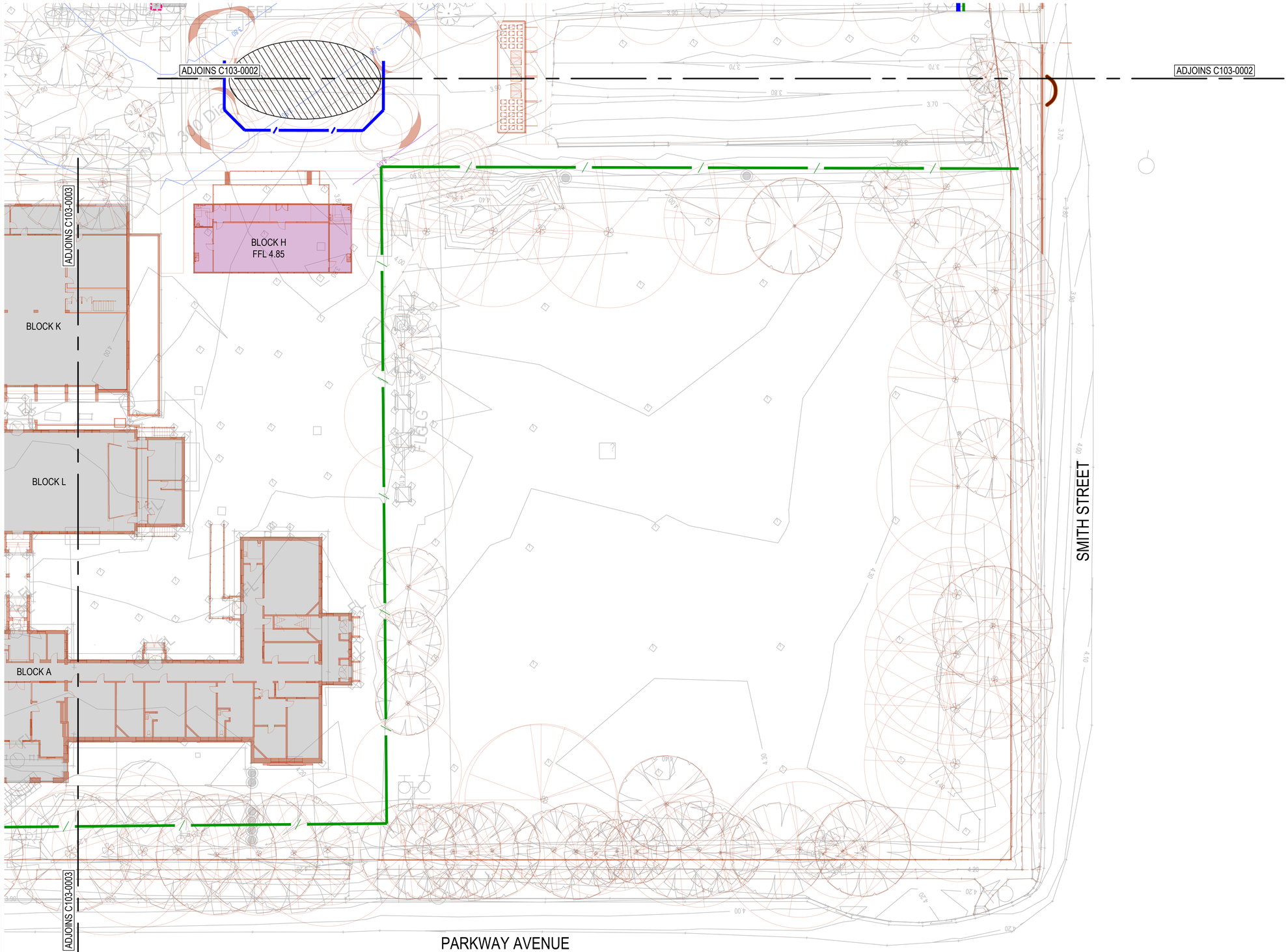

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SHEET 4

Drawn	Designed	Q.A. Check	Date	Scale @ A1
MDM	JK	JPR	28.03.24	1:250

Project No.	Drawing No.	Issue
NS230761	C103-0004	B

EROSION AND SEDIMENT CONTROL NOTES

GENERAL:

1. SWMP REFERS TO SOIL AND WATER MANAGEMENT PLAN.

2. SEDIMENT, INCLUDES, BUT IS NOT LIMITED TO, CLAY, SILT, SAND, GRAVEL, SOIL, MUD, CEMENT, AND CERAMIC WASTE THAT CAN BE WASHED FROM SITE.

3. ANY REFERENCE TO THE BLUE BOOK REFERS TO MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION. LANDCOM, 2004.

4. ANY REFERENCE TO THE IECA WHITE BOOKS (2008) REFERS TO IECA 2008. BEST PRACTICE EROSION AND SEDIMENT CONTROL. BOOKS 1-6. INTERNATIONAL EROSION CONTROL ASSOCIATION (AUSTRALASIA). PICTON NSW.

5. ANY MATERIAL DEPOSITED IN ANY CONSERVATION AREA FROM WORKS ASSOCIATED WITH THE DEVELOPMENT SHALL BE REMOVED IMMEDIATELY BY MEASURES INVOLVING MINIMAL GROUND AND/OR VEGETATION DISTURBANCE AND NO MACHINERY, OR FOLLOWING DIRECTIONS BY COUNCIL AND/OR WITHIN A TIMEFRAME ADVISED BY COUNCIL.

THE ESCP:

6. THE ESCP AND ITS ASSOCIATED ESC MEASURES SHALL BE CONSTANTLY MONITORED, REVIEWED, AND MODIFIED AS REQUIRED TO CORRECT DEFICIENCIES. COUNCIL HAS THE RIGHT TO DIRECT CHANGES IF, IN ITS OPINION, THE MEASURES THAT ARE PROPOSED OR HAVE BEEN INSTALLED ARE INADEQUATE TO PREVENT POLLUTION.

7. PRIOR TO ANY ACTIVITIES ONSITE, THE RESPONSIBLE PERSON(S) IS TO BE NOMINATED. THE RESPONSIBLE PERSON(S) SHALL BE RESPONSIBLE FOR THE ESC MEASURES ONSITE. THE NAME, ADDRESS AND 24 HOUR CONTACT DETAILS OF THE PERSON(S) SHALL BE PROVIDED TO COUNCIL IN WRITING. COUNCIL SHALL BE ADVISED WITHIN 48 HOURS OF ANY CHANGES TO THE RESPONSIBLE PERSON(S), OR THEIR CONTACT DETAILS, IN WRITING.

8. AT LEAST 14 DAYS BEFORE THE NATURAL SURFACE IS DISTURBED IN ANY STAGE, THE CONTRACTOR SHALL SUBMIT TO THE CERTIFIER, A PLAN SHOWING ESC MEASURES FOR THAT STAGE. THE DEGREE OF DESIGN DETAIL SHALL BE BASED ON THE DISTURBED AREA (UNLESS NOTED OTHERWISE).

9. AT ANY TIME, THE ESC MEASURES ONSITE SHALL BE APPROPRIATE FOR THE AREA OF DISTURBANCE AND ITS CHARACTERISTICS INCLUDING SOILS (IN ACCORDANCE WITH THOSE REQUIRED FOR THE SITE AS PER DCP).

10. THE IMPLEMENTATION OF THE ESCP SHALL BE SUPERVISED BY PERSONNEL WITH APPROPRIATE QUALIFICATIONS AND/OR EXPERIENCE IN ESC ON CONSTRUCTION SITES.

11. THE APPROVED ESCP SHALL BE AVAILABLE ON-SITE FOR INSPECTION BY COUNCIL OFFICERS WHILE WORK ACTIVITIES ARE OCCURRING.

12. THE APPROVED ESCP SHALL BE UP TO DATE AND SHOW A TIMELINE OF INSTALLATION, MAINTENANCE AND REMOVAL OF ESC MEASURES.

13. ALL ESC MEASURES SHALL BE APPROPRIATE FOR THE SEDIMENT TYPE(S) OF THE SOILS ONSITE, IN ACCORDANCE WITH THE BLUE BOOK, IECA WHITE BOOKS OR OTHER CURRENT RECOGNISED INDUSTRY STANDARD FOR ESC FOR AUSTRALIAN CONDITIONS.

14. ADEQUATE SITE DATA, INCLUDING SOIL DATA FROM A NATA APPROVED LABORATORY, SHALL BE OBTAINED TO ALLOW THE PREPARATION OF AN APPROPRIATE ESCP, AND ALLOW THE SELECTION, DESIGN AND SPECIFICATION OF REQUIRED ESC MEASURES.

15. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED ESCP (AS AMENDED FROM TIME TO TIME) UNLESS CIRCUMSTANCES ARISE WHERE:

    a) COMPLIANCE WITH THE ESCP WOULD INCREASE THE POTENTIAL FOR ENVIRONMENTAL HARM; OR
    b) CIRCUMSTANCES CHANGE DURING CONSTRUCTION AND THOSE CIRCUMSTANCES COULD NOT HAVE BEEN FORESEEN; OR
    c) COUNCIL DETERMINES THAT UNACCEPTABLE OFF-SITE SEDIMENTATION IS OCCURRING AS A RESULT OF A LAND-DISTURBING ACTIVITY. IN EITHER CASE, THE PERSON(S) RESPONSIBLE MAY BE REQUIRED TO TAKE ADDITIONAL, OR ALTERNATIVE PROTECTIVE ACTION, AND/OR UNDERTAKE REASONABLE RESTORATION WORKS WITHIN THE TIMEFRAME SPECIFIED BY THE COUNCIL.

16. ADDITIONAL ESC MEASURES SHALL BE IMPLEMENTED, AND A REVISED ESCP SUBMITTED FOR APPROVAL TO THE CERTIFIER (WITHIN FIVE BUSINESS DAYS OF ANY SUCH AMENDMENTS) IN THE EVENT THAT:

    a) THERE IS A HIGH PROBABILITY THAT SERIOUS OR MATERIAL ENVIRONMENTAL HARM MAY OCCUR AS A RESULT OF SEDIMENT LEAVING THE SITE; OR
    b) THE IMPLEMENTED WORKS FAIL TO ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES SPECIFIED IN THESE CONDITIONS; OR
    c) SITE CONDITIONS SIGNIFICANTLY CHANGE; OR
    d) SITE INSPECTIONS INDICATE THAT THE IMPLEMENTED WORKS ARE FAILING TO ACHIEVE THE "OBJECTIVE" OF THE ESCP.

17. A COPY OF ANY AMENDED ESCP SHALL BE FORWARDED TO AN APPROPRIATE COUNCIL OFFICER, WITHIN FIVE BUSINESS DAYS OF ANY SUCH AMENDMENTS.

EROSION AND SEDIMENT CONTROL NOTES

SITE ESTABLISHMENT INCLUDING CLEARING AND MULCHING:

18. NO CLEARING SHALL BE UNDERTAKEN UNLESS PRECEDED BY THE INSTALLATION OF ADEQUATE DRAINAGE AND SEDIMENT CONTROL MEASURES, UNLESS SUCH CLEARING IS REQUIRED FOR THE PURPOSE OF INSTALLING SUCH MEASURES, IN WHICH CASE, ONLY THE MINIMUM CLEARING REQUIRED TO INSTALL SUCH MEASURES SHALL OCCUR.

19. BULK TREE CLEARING AND GRUBBING OF THE SITE SHALL BE IMMEDIATELY FOLLOWED BY SPECIFIED TEMPORARY EROSION CONTROL MEASURES (E.G. TEMPORARY GRASSING OR MULCHING) PRIOR TO COMMENCEMENT OF EACH STAGE OF CONSTRUCTION WORKS.

20. TREES AND VEGETATION CLEARED FROM THE SITE SHALL BE MULCHED ONSITE WITHIN 7 DAYS OF CLEARING.

21. APPROPRIATE MEASURES SHALL BE UNDERTAKEN TO CONTROL ANY DUST ORIGINATING DUE TO THE MULCHING OF VEGETATION ONSITE.

22. ALL OFFICE FACILITIES AND OPERATIONAL ACTIVITIES SHALL BE LOCATED SUCH THAT ANY EFFLUENT, INCLUDING WASH-DOWN WATER, CAN BE TOTALLY CONTAINED AND TREATED WITHIN THE SITE.

23. ALL REASONABLE AND PRACTICABLE MEASURES SHALL BE TAKEN TO ENSURE STORMWATER RUNOFF FROM ACCESS ROADS AND STABILISED ENTRY/EXIT SYSTEMS, DRAINS TO AN APPROPRIATE SEDIMENT CONTROL DEVICE.

24. SITE EXIT POINTS SHALL BE APPROPRIATELY MANAGED TO MINIMISE THE RISK OF SEDIMENT BEING TRACKED ONTO SEALED, PUBLIC ROADWAYS.

25. STORMWATER RUNOFF FROM ACCESS ROADS AND STABILISED ENTRY/EXIT POINTS SHALL DRAIN TO AN APPROPRIATE SEDIMENT CONTROL DEVICE.

26. THE APPLICANT SHALL ENSURE AN ADEQUATE SUPPLY OF ESC, AND APPROPRIATE POLLUTION CLEAN-UP MATERIALS ARE AVAILABLE ON-SITE AT ALL TIMES.

27. ALL TEMPORARY EARTH BANKS, FLOW DIVERSION SYSTEMS, AND SEDIMENT BASIN EMBANKMENTS SHALL BE MACHINE-COMPACTED, SEEDED AND MULCHED WITHIN TEN (10) DAYS OF FORMATION FOR THE PURPOSE OF ESTABLISHING A VEGETATIVE COVER, OR LINED APPROPRIATELY.

28. SEDIMENT DEPOSITED OFF SITE AS A RESULT OF ON-SITE ACTIVITIES SHALL BE COLLECTED AND THE AREA CLEANED/REHABILITATED AS SOON AS REASONABLE AND PRACTICABLE.

29. CONCRETE WASTE AND CHEMICAL PRODUCTS, INCLUDING PETROLEUM AND OIL-BASED PRODUCTS, SHALL BE PREVENTED FROM ENTERING ANY INTERNAL OR EXTERNAL WATER BODY, OR ANY EXTERNAL DRAINAGE SYSTEM, EXCLUDING THOSE ON-SITE WATER BODIES SPECIFICALLY DESIGNED TO CONTAIN AND/OR TREAT SUCH MATERIAL. APPROPRIATE MEASURES SHALL BE INSTALLED TO TRAP THESE MATERIALS ONSITE.

30. BRICK, TILE OR MASONRY CUTTING SHALL BE CARRIED OUT ON A PERVIOUS SURFACE (E.G. GRASS OR OPEN SOIL) AND IN SUCH A MANNER THAT ANY RESULTING SEDIMENT-LADEN RUNOFF IS PREVENTED FROM DISCHARGING INTO A GUTTER, DRAIN OR WATER. APPROPRIATE MEASURES SHALL BE INSTALLED TO TRAP THESE MATERIALS ONSITE.

31. NEWLY SEALED HARD-STAND AREAS (E.G. ROADS, DRIVEWAYS AND CAR PARKS) SHALL BE SWEPT THOROUGHLY AS SOON AS PRACTICABLE AFTER SEALING/SURFACING TO MINIMISE THE RISK OF COMPONENTS OF THE SURFACING COMPOUND ENTERING STORMWATER DRAINS.

32. STOCKPILES OF ERODIBLE MATERIAL SHALL BE PROVIDED WITH AN APPROPRIATE PROTECTIVE COVER (SYNTHETIC OR ORGANIC) IF THE MATERIALS ARE LIKELY TO BE STOCKPILED FOR MORE THAN 10 DAYS.

33. STOCKPILES, TEMPORARY OR PERMANENT, SHALL NOT BE LOCATED IN AREAS IDENTIFIED AS NO-GO ZONES (INCLUDING, BUT NOT LIMITED TO, RESTRICTED ACCESS AREAS, BUFFER ZONES, OR AREAS OF NON-DISTURBANCE) ON THE ESCP.

34. NO MORE THAN 150m OF A STORMWATER, SEWER LINE OR OTHER SERVICE TRENCH SHALL TO BE OPEN AT ANY ONE TIME.

35. SITE SPOIL SHALL BE LAWFULLY DISPOSED OF IN A MANNER THAT DOES NOT RESULT IN ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.

36. WHEREVER REASONABLE AND PRACTICABLE, STORMWATER RUNOFF ENTERING THE SITE FROM EXTERNAL AREAS, AND NON-SEDIMENT LADEN (CLEAN) STORMWATER RUNOFF ENTERING A WORK AREA OR AREA OF SOIL DISTURBANCE, SHALL BE DIVERTED AROUND OR THROUGH THAT AREA IN A MANNER THAT MINIMISES SOIL EROSION AND THE CONTAMINATION OF THAT WATER FOR ALL DISCHARGES UP TO THE SPECIFIED DESIGN STORM DISCHARGE.

SITE MANAGEMENT INCLUDING DUST:

37. PRIORITY SHALL BE GIVEN TO THE PREVENTION, OR AT LEAST THE MINIMISATION, OF SOIL EROSION, RATHER THAN THE TRAPPING OF DISPLACED SEDIMENT. SUCH A CLAUSE SHALL NOT REDUCE THE RESPONSIBILITY TO APPLY AND MAINTAIN, AT ALL TIMES, ALL NECESSARY ESC MEASURES.

EROSION AND SEDIMENT CONTROL NOTES

38. MEASURES USED TO CONTROL WIND EROSION SHALL BE APPROPRIATE FOR THE LOCATION AND PREVENT SOIL EROSION AND EMISSIONS FROM SITE AT ALL TIMES, INCLUDING WORKING HOURS, OUT OF HOURS, WEEKENDS, PUBLIC HOLIDAYS, AND DURING ANY OTHER SHUTDOWN PERIODS.

39. THE APPLICATION OF LIQUID OR CHEMICAL-BASED DUST SUPPRESSION MEASURES SHALL ENSURE THAT SEDIMENT-LADEN RUNOFF RESULTING FROM SUCH MEASURES DOES NOT CREATE A TRAFFIC OR ENVIRONMENTAL HAZARD.

40. ALL DISTURBED AREAS SHALL BE STABILISED IN ACCORDANCE WITH TIME LINES IN THE BLUE BOOK.

41. ALL REASONABLE AND PRACTICABLE MEASURES SHALL BE TAKEN TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT FROM THE SITE.

42. SUITABLE ALL-WEATHER MAINTENANCE ACCESS SHALL BE PROVIDED TO ALL SEDIMENT CONTROL DEVICES.

43. SEDIMENT CONTROL DEVICES, OTHER THAN SEDIMENT BASINS, SHALL BE DE-SILTED AND MADE FULLY OPERATIONAL AS SOON AS REASONABLE AND PRACTICABLE AFTER A SEDIMENT-PRODUCING EVENT, WHETHER NATURAL OR ARTIFICIAL, IF THE DEVICE'S SEDIMENT RETENTION CAPACITY FALLS BELOW 75% OF ITS DESIGN RETENTION CAPACITY.

44. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING DRAINAGE CONTROL MEASURES, SHALL BE MAINTAINED IN PROPER WORKING ORDER AT ALL TIMES DURING THEIR OPERATIONAL LIVES.

45. WASHING/FLUSHING OF SEALED ROADWAYS SHALL ONLY OCCUR WHERE SWEEPING HAS FAILED TO REMOVE SUFFICIENT SEDIMENT AND THERE IS A COMPELLING NEED TO REMOVE THE REMAINING SEDIMENT (E.G. FOR SAFETY REASONS). IN SUCH CIRCUMSTANCES, ALL REASONABLE AND PRACTICABLE SEDIMENT CONTROL MEASURES SHALL BE USED TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT INTO RECEIVING WATERS. ONLY THOSE MEASURES THAT WILL NOT CAUSE SAFETY AND PROPERTY FLOODING ISSUES SHALL BE EMPLOYED. SEDIMENT REMOVED FROM ROADWAYS SHALL BE DISPOSED OF IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.

46. SEDIMENT REMOVED FROM SEDIMENT TRAPS AND PLACES OF SEDIMENT DEPOSITION SHALL BE DISPOSED OF IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.

SEDIMENT BASINS - INSTALLATION, MAINTENANCE AND REMOVAL INCLUDING SEDIMENT TRAPS:

47. AS-CONSTRUCTED PLANS SHALL BE PREPARED FOR ALL CONSTRUCTED SEDIMENT BASINS AND ASSOCIATED EMERGENCY SPILLWAYS. SUCH PLANS SHALL VERIFY THE BASIN'S DIMENSIONS, LEVELS AND VOLUMES COMPLY WITH THE APPROVED DESIGN DRAWINGS. THESE PLANS MAY BE REQUESTED BY THE CERTIFIER OR COUNCIL.

48. SEDIMENT BASINS SHALL BE CONSTRUCTED AND FULLY OPERATIONAL PRIOR TO ANY OTHER SOIL DISTURBANCE IN THEIR CATCHMENT.

49. INSTALL AN INTERNAL GATED VALVE, OR SIMILAR, IN ANY OUTLET PIPE ONCE PIPES INSTALLED, OR INSTALL A SACRIFICIAL PIPE FROM BASIN THROUGH WALL TO EXTERNAL OUTLET POINT. THE VALVE SHALL BE CONNECTED TO A RISER MADE FROM SLOTTED PIPE IN THE BASIN. THE VALVE MAY BE OPENED ONCE CAPTURED WATER MEETS WATER QUALITY REQUIREMENTS. THE FINAL SETUP FOR TEMPORARY INTERNAL OUTLET STRUCTURES TO BE CONFIRMED PRIOR TO CONSTRUCTION WITH COUNCIL. THIS SETUP WILL ENABLE DISCHARGE OF TREATED WATER FROM SITE WITHOUT NEED FOR PUMPING.

50. A SEDIMENT STORAGE LEVEL MARKER POST SHALL BE WITH A CROSS MEMBER SET JUST BELOW THE TOP OF THE SEDIMENT STORAGE ZONE (AS SPECIFIED ON THE APPROVED ESCP). AT LEAST A 75mm WIDE POST SHALL BE FIRMLY SET INTO THE BASIN FLOOR.

51. THE SITE MANAGER SHALL OBTAIN THE RELEVANT APPROVALS FROM THE RELEVANT ORGANISATIONS TO DISCHARGE TREATED WATER FROM ANY EXISTING BASINS. ORGANISATIONS MAY INCLUDE, BUT NOT BE LIMITED TO, HUNTER WATER, AND COUNCIL.

52. WHERE MORE THAN ONE STAGE IS TO BE DEVELOPED AT ONE TIME, OR BEFORE THE PRECEDING STAGE IS COMPLETE, THE SEDIMENT BASIN(S) FOR THESE STAGES SHALL HAVE SUFFICIENT CAPACITY TO CATER FOR ALL AREA DIRECTED TO THE BASIN(S).

53. PRIOR TO ANY FORECAST WEATHER EVENT LIKELY TO RESULT IN RUNOFF, ANY BASINS/TRAPS SHALL BE DEWATERED TO PROVIDE SUFFICIENT CAPACITY TO CAPTURE SEDIMENT LADEN WATER FROM THE SITE.

54. SUFFICIENT QUANTITIES OF CHEMICALS/AGENTS TO TREAT CAPTURED WATER SHALL BE PLACED SUCH THAT WATER ENTERING THE BASIN MIXES WITH THE CHEMICAL/AGENTS AND IS CARRIED INTO THE BASIN TO SPEED UP CLARIFICATION.

55. ANY BASIN SHALL BE DEWATERED WITHIN THE X-DAY RAINFALL DEPTH USED TO CALCULATE THE CAPACITY OF THE BASIN, AFTER A RAINFALL EVENT.

56. SUFFICIENT QUANTITIES OF CHEMICALS/AGENTS TO TREAT TURBID WATER SHALL BE SECURELY STORED ON-SITE TO PROVIDE FOR AT LEAST THREE COMPLETE

EROSION AND SEDIMENT CONTROL NOTES

TREATMENTS OF ALL BASINS REQUIRING CHEMICALLY TREATMENT ONSITE.

57. PRIOR TO THE CONTROLLED DISCHARGE (E.G. DE-WATERING ACTIVITIES) FROM SITE INCLUDING EXCAVATIONS AND/OR SEDIMENT BASINS, THE FOLLOWING WATER QUALITY OBJECTIVES SHALL BE ACHIEVED:
    A) TOTAL SUSPENDED SOLIDS (TSS) TO A MAXIMUM 50 MILLIGRAMS/L;
    B) WATER PH BETWEEN 6.5 AND 8.5, UNLESS OTHERWISE REQUIRED BY THE COUNCIL;
    C) TURBIDITY (MEASURED IN NTUS) TO A MAXIMUM OF 60 NTU); AND
    D) EC LEVELS NO GREATER THAN BACKGROUND LEVELS.

60. THE DEVELOPMENT APPROVAL MAY REQUIRE TESTING OF ADDITIONAL WATER QUALITY ELEMENTS PRIOR TO DISCHARGE. E.G. INCLUDING BUT NOT LIMITED TO METALS, ORGANIC SUBSTANCES, CHEMICALS OR BACTERIOLOGICAL INDICATORS.

61. A SAMPLE OF THE RELEASED TREATED WATER SHALL BE KEPT ONSITE IN A CLEAR CONTAINER WITH THE SAMPLE DATE RECORDED ON IT.

62. WATER QUALITY SAMPLES SHALL BE TAKEN AT A DEPTH NO LESS THAN 200MM BELOW THE WATER SURFACE OF THE BASIN.

63. NO ALUMINIUM BASED PRODUCTS MAY BE USED TREAT CAPTURED WATER ONSITE WITHOUT THE PRIOR WRITTEN PERMISSION FROM AN APPROPRIATE COUNCIL OFFICER. THE APPLICANT SHALL HAVE A DEMONSTRATED ABILITY TO USE SUCH PRODUCTS CORRECTLY AND WITHOUT ENVIRONMENTAL HARM PRIOR TO ANY APPROVAL.

64. THE CHEMICAL/AGENT USED IN TYPE D AND TYPE F BASINS TO TREAT CAPTURED WATER CAPTURED IN THE BASIN SHALL BE APPLIED IN CONCENTRATIONS SUFFICIENT TO ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES WITHIN THE X-DAY RAINFALL DEPTH USED TO CALCULATE THE CAPACITY OF THE BASIN, AFTER A RAINFALL EVENT.

65. ALL MANUFACTURERS' INSTRUCTIONS SHALL BE FOLLOWED FOR ANY CHEMICALS/AGENTS USED ONSITE, EXCEPT WHERE APPROVED BY THE RESPONSIBLE PERSON OR AN APPROPRIATE COUNCIL OFFICER.

66. THE APPLICANT SHALL ENSURE THAT ON EACH OCCASION A TYPE C BASIN WAS NOT DE-WATERED PRIOR TO BEING SURCHARGED BY A FOLLOWING RAINFALL EVENT, A REPORT IS PRESENTED TO AN APPROPRIATE COUNCIL OFFICER WITHIN 5 DAYS IDENTIFYING THE CIRCUMSTANCES AND PROPOSED AMENDMENTS, IF ANY, TO THE BASIN'S OPERATING PROCEDURES.

67. SETTLED SEDIMENT SHALL BE REMOVED AS SOON AS REASONABLE AND PRACTICABLE FROM ANY SEDIMENT BASIN IF:
    a) IT IS ANTICIPATED THAT THE NEXT STORM EVENT IS LIKELY TO CAUSE SEDIMENT TO SETTLE ABOVE THE BASIN'S SEDIMENT STORAGE ZONE; OR
    b) THE ELEVATION OF SETTLED SEDIMENT IS ABOVE THE TOP OF THE BASIN'S SEDIMENT STORAGE ZONE; OR
    c) THE ELEVATION OF SETTLED SEDIMENT IS ABOVE THE BASINS SEDIMENT MARKER LINE.

68. SCOUR PROTECTION MEASURES PLACED ON SEDIMENT BASIN EMERGENCY SPILLWAYS SHALL APPROPRIATELY PROTECT THE SPILLWAY CHUTE AND ITS SIDE BATTERS FROM SCOUR, AND SHALL EXTEND A MINIMUM OF 3M BEYOND THE DOWNSTREAM TOE OF THE BASIN'S EMBANKMENT.

69. SUITABLE ALL-WEATHER MAINTENANCE ACCESS SHALL BE PROVIDED TO ALL SEDIMENT CONTROL DEVICES.

70. MATERIALS, WHETHER LIQUID OR SOLID, REMOVED FROM ANY ESC MEASURE OR EXCAVATION DURING MAINTENANCE OR DECOMMISSIONING, SHALL BE DISPOSED OF IN A MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION, WATER POLLUTION OR ENVIRONMENTAL HARM.

71. ALL SEDIMENT BASINS SHALL REMAIN FULLY OPERATIONAL AT ALL TIMES UNTIL THE BASIN'S DESIGN CATCHMENT ACHIEVES 70% GROUND COVER OR SURFACE STABILISATION ACCEPTABLE TO COUNCIL.

72. THE ESC MEASURES INSTALLED DURING THE DECOMMISSIONING AND REHABILITATION OF A SEDIMENT BASIN SHALL COMPLY WITH SAME STANDARDS SPECIFIED FOR THE NORMAL CONSTRUCTION WORKS.

73. A SEDIMENT BASIN SHALL NOT BE DECOMMISSIONED UNTIL ALL UP-SLOPE SITE STABILISATION MEASURES HAVE BEEN IMPLEMENTED AND ARE APPROPRIATELY WORKING TO CONTROL SOIL EROSION AND SEDIMENT RUNOFF..

74. IMMEDIATELY PRIOR TO THE CONSTRUCTION OF THE PERMANENT STORMWATER TREATMENT DEVICE, APPROPRIATE FLOW BYPASS CONDITIONS SHALL BE ESTABLISHED TO PREVENT SEDIMENT-LADEN WATER ENTERING THE DEVICE.

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B	ISSUED FOR PRELIMINARY REVIEW	28.03.24	MDM	JPR
A	ISSUED FOR PRELIMINARY REVIEW	19.03.24	MDM	JPR

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Drawing Title
CIVIL SERVICES
EROSION AND SEDIMENT CONTROL NOTES
SHEET 1

Drawn	Designed	Q.A. Check	Date	Scale @ A1
MDM	JK	JPR	28.03.24	N.T.S.

Project No.	Drawing No.	Issue
NS230761	C103-0101	B

EROSION AND SEDIMENT CONTROL NOTES

REVEGETATION/STABILISATION:

75. TEMPORARY STABILISATION MAY BE ATTAINED USING VEGETATION, NON REWETTABLE SOIL POLYMERS, OR PNEUMATICALLY APPLIED EROSION CONTROLS.

76. AT THE COMPLETION OF FORMATION IN ANY SECTION, ALL DISTURBED AREAS SHALL BE STABILISED IN ACCORDANCE WITH TIME LINES IN THE BLUE BOOK.

77. THE CITY OF NEWCASTLE SEED MIX SHALL BE USED UNLESS STATED ON THE ESCP/SWMP.

78. THE PH LEVEL OF TOPSOIL SHALL BE APPROPRIATE TO ENABLE ESTABLISHMENT AND GROWTH OF SPECIFIED VEGETATION PRIOR TO INITIATING THE ESTABLISHMENT OF VEGETATION.

79. NON REWETTABLE BINDER SHALL BE USED IN ALL HYDROMULCH/HYDROSEED/POLYMER MIXES ON SLOPES OR WORKS ADJACENT TO A WATER COURSE.

80. SOIL AMELIORANTS SHALL BE ADDED TO THE SOIL IN ACCORDANCE WITH AN APPROVED LANDSCAPE PLAN, VEGETATION MANAGEMENT PLAN, AND/OR SOIL ANALYSIS.

81. SURFACE SOIL DENSITY, COMPACTION AND SURFACE ROUGHNESS SHALL BE ADJUSTED PRIOR TO SEEDING/PLANTING IN ACCORDANCE WITH AN APPROVED LANDSCAPE PLAN, VEGETATION MANAGEMENT PLAN, AND/OR SOIL ANALYSIS.

82. PROCEDURES FOR INITIATING A SITE SHUTDOWN, WHETHER PROGRAMMED OR UN-PROGRAMMED, SHALL INCORPORATE REVEGETATION OF ALL SOIL DISTURBANCES UNLESS OTHERWISE APPROVED BY COUNCIL. THE STABILISATION WORKS SHALL NOT RELY UPON THE LONGEVITY OF NON-VEGETATED EROSION CONTROL BLANKETS, OR TEMPORARY SOIL BINDERS.

SITE MONITORING AND MAINTENANCE:

83. THE APPLICANT SHALL ENSURE THAT APPROPRIATE PROCEDURES AND SUITABLY QUALIFIED PERSONNEL ARE ENGAGED TO PLAN AND CONDUCT SITE INSPECTIONS AND WATER QUALITY MONITORING THROUGHOUT THE CONSTRUCTION AND MAINTENANCE PHASE.

84. ALL ESC MEASURES SHALL BE INSPECTED AND ANY MAINTENANCE UNDERTAKEN IMMEDIATELY:
    A) AT LEAST DAILY (WHEN WORK IS OCCURRING ON-SITE); AND
    B) AT LEAST WEEKLY (WHEN WORK IS NOT OCCURRING ON-SITE); AND
    C) WITHIN 24HRS OF EXPECTED RAINFALL; AND
    D) WITHIN 18HRS OF A RAINFALL EVENT THAT CAUSES RUNOFF ON THE SITE.

85. WRITTEN RECORDS SHALL BE KEPT ONSITE OF ESC MONITORING AND MAINTENANCE ACTIVITIES CONDUCTED DURING THE CONSTRUCTION AND MAINTENANCE PERIODS, AND BE AVAILABLE TO COUNCIL OFFICERS ON REQUEST.

86. ALL ENVIRONMENTALLY RELEVANT INCIDENTS SHALL BE RECORDED IN A FIELD LOG THAT SHALL REMAIN ACCESSIBLE TO ALL RELEVANT REGULATORY AUTHORITIES.

87. ALL WATER QUALITY DATA, INCLUDING DATES OF RAINFALL, DATES OF TESTING, TESTING RESULTS AND DATES OF WATER RELEASE, SHALL BE KEPT IN AN ON-SITE REGISTER. THE REGISTER IS TO BE MAINTAINED UP TO DATE FOR THE DURATION OF THE APPROVED WORKS AND BE AVAILABLE ON-SITE FOR INSPECTION BY ALL RELEVANT REGULATORY AUTHORITIES ON REQUEST.

88. AT NOMINATED INSTREAM WATER MONITORING SITES, A MINIMUM OF 3 WATER SAMPLES SHALL BE TAKEN AND ANALYSED, AND THE AVERAGE RESULT USED TO DETERMINE QUALITY.

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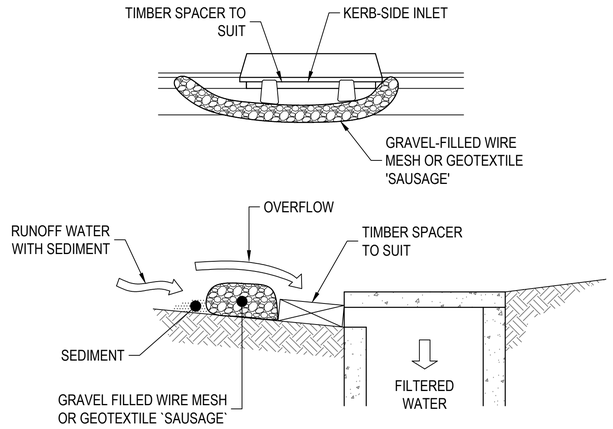
EROSION AND SEDIMENT CONTROL NOTES
SHEET 2

Drawn	Designed	Q.A. Check	Date	Scale @ A1
MDM	JK	JPR	28.03.24	N.T.S.

Project No.	Drawing No.	Issue
NS230761	C103-0102	B



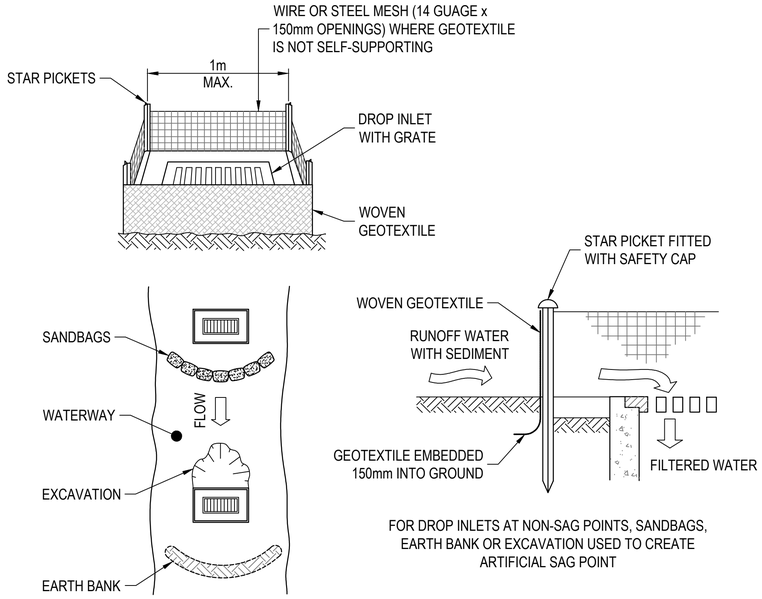
NOTE:
THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.

MESH AND GRAVEL INLET FILTER - SD6-11

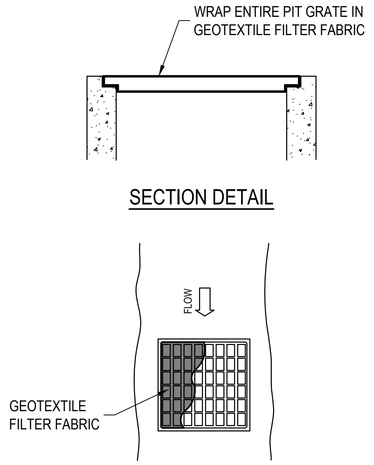
NOT TO SCALE

CONSTRUCTION NOTES:

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 20m TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150MM HIGH X 400MM WIDE.
4. PLACE THE FILTER AT THE OPENING, LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

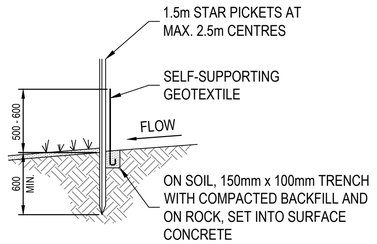


FOR DROP INLETS AT NON-SAG POINTS, SANDBAGS, EARTH BANK OR EXCAVATION USED TO CREATE ARTIFICIAL SAG POINT



GEOTEXTILE WRAPPED GRATE

NTS



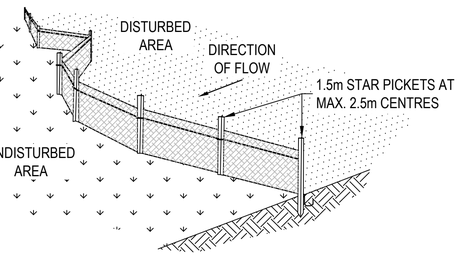
SECTION DETAIL

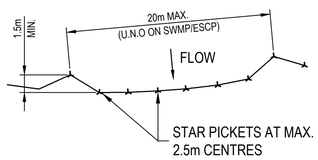
GEOTEXTILE INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1m CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER DETAIL (TO SD6-12)

NOT TO SCALE





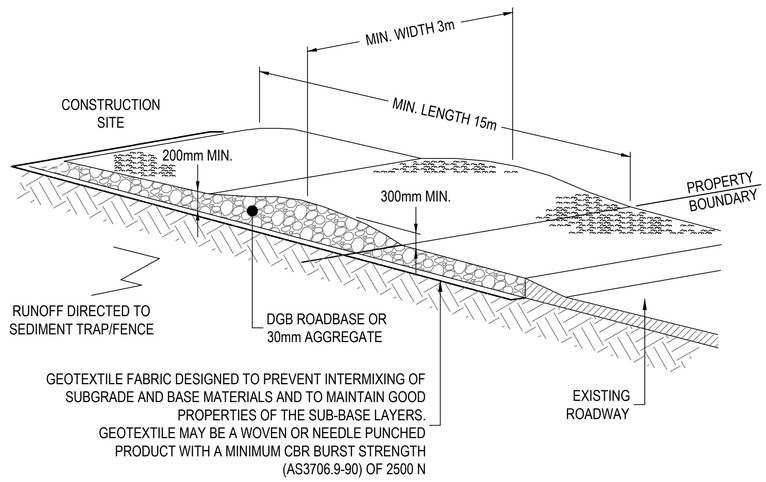
PLAN

SEDIMENT FENCE CONSTRUCTION NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50L PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10 YR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.5m INTERVALS (MAX) AT THE DOWN SLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECCOMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THROUGHLY OVER THE GEOTEXTILE.

SEDIMENT CONTROL FENCE DETAIL (TO SD6-8)

NOT TO SCALE



STABILISED SITE ACCESS CONSTRUCTION NOTES:

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15m LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3m WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

STABILISED SITE ACCESS DETAIL (TO SD6-14)

NOT TO SCALE

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B	ISSUED FOR PRELIMINARY REVIEW	28.03.24	MDM	JPR
A	ISSUED FOR PRELIMINARY REVIEW	19.03.24	MDM	JPR

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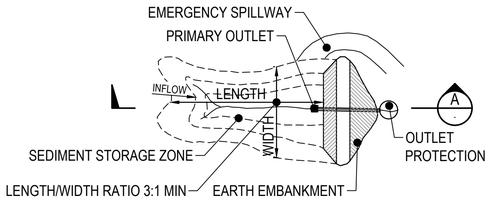
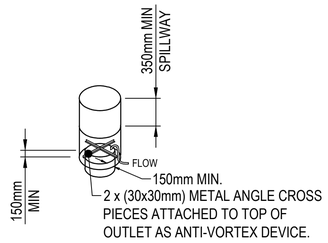
Drawing Title: CIVIL SERVICES
EROSION AND SEDIMENT CONTROL DETAILS
SHEET 1

Drawn	Designed	Q.A. Check	Date	Scale @ A1
MDM	JK	JPR	28.03.24	N.T.S.

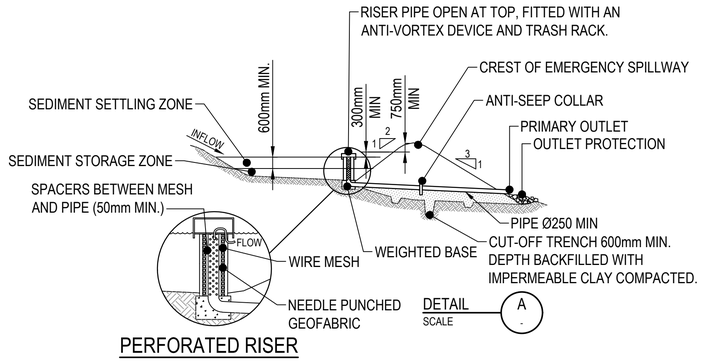
Project No.	Drawing No.	Issue
NS230761	C103-0201	B



PLAN VIEW



TRASH RACK/ANTI-VORTEX DEVICE

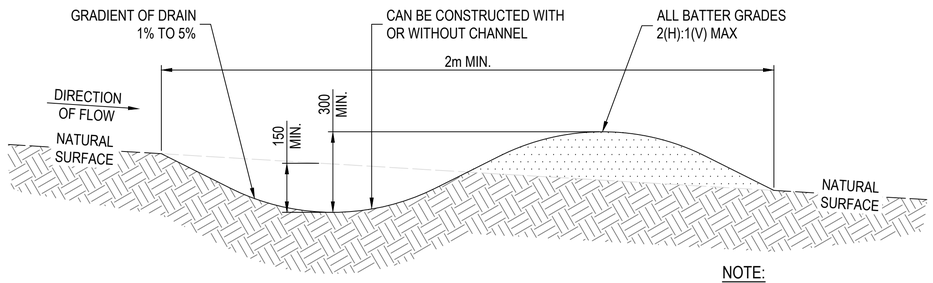


PERFORATED RISER

EARTH BASIN - DRY (SD 6-3)

CONSTRUCTION NOTES

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. FORM A CUT OFF TRENCH UNDER THE CENTRELINE OF THE EMBANKMENT 600mm DEEP AND 1200mm WIDE, EXTENDING TO A POINT ON THE WATERCOURSE WALL ABOVE THE RISER SILL LEVEL.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL ACCORDING TO THE SWMP THAT IS FREE FROM ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND THE COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. INSTALL THE PIPE OUTLET WITH SEEPAGE COLLARS AS SPECIFIED IN THE SWMP AND STANDARD DRAWING 6-3B.
8. FORM BATTER GRADES AT 2(H):1(V) UPSTREAM AND 3(H):1(V) DOWNSTREAM OR AS SPECIFIED IN THE SWMP.



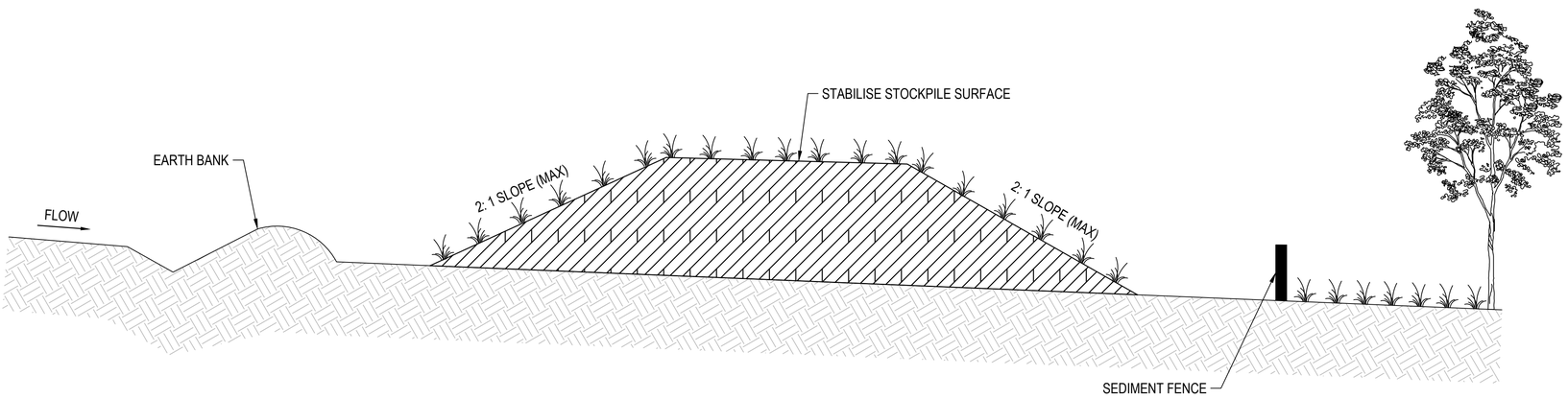
DIRTY WATER DIVERSION DRAIN (TO SD5-5)

NOT TO SCALE

NOTE:
ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80m.

CONSTRUCTION NOTES:

1. BUILD WITH GRADIENTS BETWEEN 1% AND 5%.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS, NOT V SHAPED.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.



STOCKPILE DETAIL (TO SD4-1)

NOT TO SCALE

STOCKPILE CONSTRUCTION NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON UPSLOP SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2 METRES DOWNSLOPE.

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Drawing Title
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Drawn	Designed	Q.A. Check	Date	Scale @ A1
MDM	JK	JPR	28.03.24	N.T.S.

Project No.	Drawing No.	Issue
NS230761	C103-0202	B

Appendix B Sediment Basin Calculations

Note: These "Standard Calculation" spreadsheets relate only to low erosion hazard lands as identified in figure 4.6 where the designer chooses to not use the RUSLE to size sediment basins. The more "Detailed Calculation" spreadsheets should be used on high erosion hazard lands as identified by figure 4.6 or where the designer chooses to run the RUSLE in calculations.

1. Site Data Sheet

Site name: Newcastle High School

Site location: Newcastle High School

Precinct: Newcastle High School

Description of site: School Redevelopment

Site area	Site						Remarks
	1	2	3	4	5	6	
Total catchment area (ha)	0.65						
Disturbed catchment area (ha)	0.65						

Soil analysis

Soil landscape							DIPNR mapping (if relevant)
Soil Texture Group	C						Sections 6.3.3(c), (d) and (e)

Rainfall data

Design rainfall depth (days)	5						See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)	85						See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event	38.9						See Section 6.3.4 (h)
Rainfall intensity: 2-year, 6-hour storm	9.84						See IFD chart for the site
Rainfall erosivity (R-factor)	2150						Automatic calculation from above data

Comments:

2. Storm Flow Calculations

Peak flow is given by the Rational Formula:

$$Qy = 0.00278 \times C_{10} \times F_Y \times I_{y,\,tc} \times A$$

where:

- Q_y is peak flow rate (m^3/sec) of average recurrence interval (ARI) of "Y" years
- C_{10} is the runoff coefficient (dimensionless) for ARI of 10 years. Rural runoff coefficients are given in Volume 2, figure 5 of Pilgrim (1998), while urban runoff coefficients are given in Volume 1, Book VIII, figure 1.13 of Pilgrim (1998) and construction runoff coefficients are given in Appendix F
- F_y is a frequency factor for "Y" years. Rural values are given in Volume 1, Book IV, Table 1.1 of Pilgrim (1998) while urban coefficients are given in Volume 1, Book VIII, Table 1.6 of Pilgrim (1998)
- A is the catchment area in hectares (ha)
- $I_{y,\,tc}$ is the average rainfall intensity (mm/hr) for an ARI of "Y" years and a design duration of "tc" (minutes or hours)

Time of concentration (t_c) = $0.76 \times (A/100)^{0.38}$ hrs (Volume 1, Book IV of Pilgrim, 1998)

Note: For urban catchments the time of concentration should be determined by more precise calculations or reduced by a factor of 50 per cent.

Peak flow calculations, 1

Site	A (ha)	tc (mins)	Rainfall intensity, I, mm/hr						C_{10}
			$1_{yr,tc}$	$5_{yr,tc}$	$10_{yr,tc}$	$20_{yr,tc}$	$50_{yr,tc}$	$100_{yr,tc}$	
1	0.65	7	73.7	122	149	177	218	252	0.82
2									
3									
4									
5									
6									

Peak flow calculations, 2

ARI yrs	Frequency factor (F_y)	Peak flows						Comment
		1	2	3	4	5	6	
		(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m3/s)	
$1_{yr,\,tc}$	0.8	0.087						
$5_{yr,\,tc}$	0.95	0.172						
$10_{yr,\,tc}$	1	0.221						
$20_{yr,\,tc}$	1.05	0.275						
$50_{yr,\,tc}$	1.15	0.371						
$100_{yr,\,tc}$	1.2	0.448						

3. Volume of Sediment Basins: *Type C* Soils

Basin volume = settling zone volume + sediment storage volume

Settling Zone Volume

The settling zone volume for *Type C* soils is calculated to provide capacity to allow the design particle (e.g. 0.02 mm in diameter) to settle in the peak flow expected from the design storm (e.g. 0.25-year ARI). The volume of the basin's settling zone (V) can be determined as a function of the basin's surface area and depth to allow for particles to settle. Peak flow/discharge for the 0.25-year, ARI storm is given by the Rational Formula:

$$Q_{tc,\,0.25} = 0.5 \times [0.00278 \times C_{10} \times F_y \times I_{1yr,\,tc} \times A\,] \ (m^3/sec)$$

where:

$Q_{tc,0.25}$ = flow rate (m^3/sec) for the 0.25 ARI storm event

C_{10} = runoff coefficient (dimensionless for ARI of 10 years)

F_y = frequency factor for 1 year ARI storm

$I_{1\,yr,tc}$ = average rainfall intensity (mm/hr) for the 1-year ARI storm

A = area of catchment in hectares (ha)

Basin surface area (A) = area factor x $Q_{tc,\,0.25}$ m^2

Particle settling velocities under ideal conditions (Section 6.3.5(e))

Particle Size	Area Factor
0.100	170
0.050	635
0.020	4100

Volume of settling zone = basin surface area x depth (Section 6.3.5(e)(ii))

Sediment Storage Zone Volume

In the standard calculation, the sediment storage zone is 100 percent of the setting zone. However, designers can work to capture the 2-month soil loss as calculated by the RUSLE (Section 6.3.5(e)(iv)), in which case the "Detailed Calculation" spreadsheets should be used.

Total Basin Volume

Site	$Q_{tc,\,0.25}$ (m^3/s)	Area factor	Basin surface area (m^2)	Depth of settling zone (m)	Settling zone volume (m^3)	Sediment storage volume (m^3)	Total basin volume (m^3)	Basin shape		
								L:W Ratio	Length (m)	Width (m)
1	0.044	4100	179	0.6	107	107	215			
2		4100								
3		4100								
4		4100								
5		4100								
6		4100								

Appendix C Douglas Partners Acid Sulphate Soil Management Plan

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Acid Sulfate Soil Management Plan

Newcastle High School Upgrade
25a National Park Street, Newcastle West

Prepared for
School Infrastructure NSW

Project 213618.02
May 2023

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	213618.02	Document No.	R.004.Rev1
Document title	Report on Acid Sulfate Soil Management Plan Newcastle High School Upgrade		
Site address	25a National Park Street, Newcastle West		
Report prepared for	School Infrastructure NSW		
File name	213618.02.R.004.Rev1.ASSMP.docx		

Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Mitchell Vallely	Matthew Blackert	2 March 2023
Revision 1	Mitchell Vallely	Matthew Blackert	23 May 2023

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	0	Meaghan Bennett, School Infrastructure NSW Tessa Sharp, The APP Group Anthony Harrigan, The APP Group
Revision 1	1	0	Meaghan Bennett, School Infrastructure NSW Tessa Sharp, The APP Group Anthony Harrigan, The APP Group

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		23 May 2023
Reviewer		23 May 2023

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Acid Sulfate Soil Management Plan
Newcastle High School Upgrade
25a National Park Street, Newcastle West

1. Introduction

Douglas Partners Pty Ltd (DP) has prepared this acid sulfate soil management plan (ASSMP) for the proposed Newcastle High School (NHS) upgrade located at 25a National Park Street, Newcastle West (the 'site'). The proposed development comprises a new three storey learning hub, new multipurpose hall and the demolition of some existing structures.

It is understood that the ASSMP is required based on the potential for the disturbance of acid sulfate soils (ASS) during construction for the proposed development.

The ASSMP provides methods and strategies to minimise the potential for adverse impact associated with the disturbance of ASS during construction of the proposed development. This ASSMP provides the following:

- ASS management strategies;
- Monitoring program for soil and water quality; and
- Contingency procedures.

This ASSMP has been prepared based on the results of a previous geotechnical and preliminary ASS investigation conducted by Martens (2021) within the site). In lieu of ASS data for deeper soils extending to the full depth of proposed piling, this ASSMP has also been prepared based on DP's experience in the area with respect to ASS conditions.

This ASSMP was prepared with reference to the following:

- *Acid Sulfate Soil Manual*, Acid Sulfate Soil Management Advisory Committee [ASSMAC] (Stone, Ahern, & Blunden, 1998);
- *Acid Sulfate Soils Laboratory Methods Guidelines. In Queensland Acid Sulfate Soils Manual 2004* [QASSIT] (Ahern, McElnea, & Sullivan, 2004);
- *Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines* (Dear, et al., 2014); and
- *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual* (Sullivan, et al., 2018).

2. Proposed Development

It is understood that the development at the Newcastle High School (Newcastle Education Campus) will include the following scope:

- Demolition of eight (8) existing buildings;
- Construction of a new three (3) storey learning hub located on the southwestern corner of the campus, including a new library, canteen, covered outdoor learning area (COLA), support learning unit, general learning spaces, hospitality teaching spaces, and science labs;
- Construction of a new multi-purpose facility (MPF) located in the north-eastern corner of the campus including a gymnasium, stage, fitness lab, flexible learning spaces, outdoor courts, and end-of-trip (EOT) facilities;
- Internal refurbishment works within the existing administration building on Parkway Ave to form a new student hub;
- New student entry from Parkway Avenue;
- Relocation of Block H approximately 50m South;
- Ancillary works to enable the proposed upgrades and include new civil infrastructure and a comprehensive landscaping strategy.

Plans of the proposed development are shown in Appendix C.

Preliminary earthworks plans provided in Appendix C indicate generally minor cuts (260 m^3) and more substantial fill (8,964 m^3) for an overall balance of fill at 8,664 m^3. It is understood that the north-eastern part of the site will remain at similar levels for flooding requirements. Furthermore, stormwater infiltration beds are proposed around the school area.

It is understood, however, that continuous flight auger (CFA) piles are proposed for some structures, notably the MPF building in the north-eastern corner of the campus. Piles may be founded to depths of 8 m to 10.5 m below ground level (down to approx. RL -8.5 AHD) to target the medium dense to dense sand layer reported in DP (2022).

3. Site Description

Site Address	25a National Park Street, Newcastle West, NSW.
Legal Description	Part Lot 1 Deposited Plan (D.P) 150725; Part Lot 1 D.P. 575171; Part Lot 1 D.P. 794827.
Area	Site investigation area approximately 21,700 m^2 (2.17 ha) – red in Figure 1; Total area of above lots (overall school) approximately 46,000 m^2 (4.6 ha) – yellow in Figure 1.
Zoning	Zone R2 Low density residential.

Local Council Area	Newcastle City Council.
Current Use	Secondary (high) school.
Surrounding Uses	North / North-east: • Fearnley Dawes Athletic Centre (private recreational field); • Merewether Scout Hall. North-east / east: • Public netball courts and playing fields (National Park No 5 and 6 Sportsground); • Private recreation (Wanderers Rugby Club and National Park No 2 Sportsground. South-east, south, west and north-west: • Residential.

The site is shown on Figure 1.

Figure 1: School Boundary (yellow) and site investigation boundary 'the site' (red)

4. Environmental Setting

Site Topography	Reference to the NSW Contours Hunter and Central Coast LiDAR indicates ground levels range from about RL 4 / 4.5 (AHD) on the southern and western parts to about RL 2.5 on the eastern site of the lot. The land falls gently to the north-east for most of the site, which terraces down to the lowest areas in the north-east near the northern lot boundary.
Regional Topography	The surrounding area is located at RLs 5-6 with locally lower areas, typically in drainage canals. More regionally, the topography varied greatly near the coastal and Newcastle Harbour areas.
Soil Landscape	Reference to the Newcastle 1:100,000 Soil Landscapes Sheet indicates the site is located within the Hamilton soil landscape comprising quaternary deposits in the Hunter Plain region. This group comprises 'deep' soils (>15cm), well-drained weak Podzols with some 'deep' (>100cm) well-drained Brown Podzolic Soils on fans. Limitations include wind erosion hazard, groundwater pollution hazard, strong acidity, non-cohesive soils.
Geology	Reference to the Newcastle Coalfields Surface Geology Sheet, published by BHP, indicates that the site is underlain by alluvial soils which overlie rock strata of the Newcastle Coal Measures. The rock strata are of Permian age and typically comprise sandstone, siltstone, claystone and multiple coal seams. Reference to the NSW Seamless Geology mapping indicates the site is underlain by the following: • Clastic sediment (QP_u) in the southern and central portion of the school site which typically comprises clay, silt and marine sand; • Anthropogenic deposits (Q_h) in the northern portion of the school site which typically comprises anthropogenic fill; and • Alluvial floodplain deposits (QH_af) in the north western portion of the site which typically comprises silt, sand and clay. The boundary line for the mapped anthropogenic deposits is shown on DP (2023) test location plan provided in Appendix C.
Acid Sulfate Soils (ASS)	Published ASS risk mapping indicates that the site is mapped as a low probability occurrence of ASS greater than 3 m below the ground surface. It is noted that ASS typically occur at levels of approximately RL 5 AHD or below, but typically at elevations less than 1 AHD in coastal environments. Previous ASS testing has been undertaken at the site my Martens (2021) which is discussed further in Section 5.2.

5. Previous Investigations

5.1 Overview

Several investigations have been undertaken for the proposed development including geotechnical, contamination and ASS assessments. A summary of the previous investigations where relevant to this ASSMP has been provided below.

5.2 Martens (2021) – Geotechnical Investigation

Martens Consulting Engineers (Martens) has undertaken a geotechnical investigation at the site. The investigation included drilling of 11 bores to depths up to 9.0 m, collection of soil samples for ASS and geotechnical testing purposes and laboratory analysis.

Pertinent results from this investigation include:

- Subsurface conditions at the site consist of:
  - Fill (mainly sand) to depths ranging between 0.2 m and 2.5 m; underlain by
  - Alluvial soils initially comprising sand which transitioned into clayey sand from depths of 5 m to 7.5 m and further into sandy clay from below about 8.0 m to 8.5 m depth.
- Deepest fill was observed in the north-eastern portion of the site;
- Groundwater was encountered at depths ranging between 2.4 m and 5.6 m;
- Laboratory analysis indicated that the samples tested were predominately sand sized with some minor proportions of sand, silt and gravel. The percentage of clay and silt was greater in the samples collected below about 7 m to 8 m depth.
- Limited ASS chromium suite testing for natural alluvial soils was undertaken for samples ranging from 1.1 m to 8.3 m bgl (approximate RL 2.9 AHD to -4.3 AHD). The results below indicated:
  - Chromium reducible sulfur (Scr – potential acidity) or total actual acidity (TAA) was not detected above the limit of reporting (LOR) for tested upper soils to about 5.5 m bgl (approximate RL 2.9 to RL-2.1);
  - Potential acidity (Scr) was identified in three samples which were at depths of 5.6 m, 5.7 m and 8.3 m bgl (approximate RL -1.7 to -4.3), with results below the adopted action criteria (0.03% S). It was reported by Martens that the soils tested were not considered to be actual or potential ASS. It is noted that the clayey soils typically had higher potential acidity (Scr) results, with the deeper sandy clay materials tested at 8.3 m depth (approximate RL -4.3) having the highest potential acidity result only marginally below the action criteria.
- Martens indicated that excavations for the proposed development were unlikely to exceed 2 m depth. Based on the results of the preliminary testing conducted by Martens and the proposed excavation depth Martens considered an ASSMP and/or further ASS testing was not required.

Envirolab laboratory reports and a results summary from the Martens (2021) investigation including groundwater depths noted by Martens at each relevant bore have been summarised in Appendix B which also includes the borehole logs from the investigation.

It is noted that Martens (2021) did not conduct ASS screening tests that are normally undertaken at regular depth intervals to profile ASS conditions and inform detailed laboratory testing requirements with reference to current guidelines (Sullivan, et al., 2018). On this basis, the ASS results in in Martens (2021) report may be considered preliminary and, therefore, variable ASS conditions may exist at the site.

5.3 DP (2022) – Geotechnical Investigation

DP has undertaken a geotechnical investigation at the site. The investigation included seven cone penetration tests (CPTs) to depths ranging between 12.34 m and 32.10 m and three bores to depths ranging between 1.1 m and 2.2 m.

Pertinent findings include the following:

- Subsurface conditions at the site consists of mainly sandy fill up to 1.2 m depth overlying alluvial soils to approximately 30 m depth. The alluvial soils consisted of predominately sand with a clay layer at about 6 m to 8 m depth. The sand layer continued to depths of 12.3 m to 14.4 m and was underlain by a layer of clay to the top of weathered rock at depths of approximately 29 m to 35 m;
- Bores confirmed the presence of abandoned mining within the Borehole Seam at a depth of approximately 55 m;
- Deepest fill was observed in the north-eastern portion of the site.

Groundwater was encountered at depths ranging between 0.5 m and 1.7 m (approximate RL 1.8 to RL 2.5). It should be noted that several measurements were undertaken following cone penetration testing and these results may be artificially higher because there may not have been sufficient time for the groundwater levels to stabilise before the measurement was taken. The water levels in the drilled bores (DP, 2023) were in the range of approximate RL 0.5 AHD to RL 2.0 AHD (discussed below).

Borehole logs for the geotechnical investigation have been provided in Appendix A.

5.4 DP (2023) – Draft Detailed Site Investigation (Contamination) (DSI)

Douglas Partners Pty Ltd (DP) has undertaken a detailed site investigation (DSI) for the proposed upgrade. The objectives of the DSI were to assess the suitability of the site for the proposed development and whether further investigation and/or management is required regarding the proposed development.

The investigation included a brief desktop / site history review, site inspection, subsurface investigation via test pits and bores, laboratory testing for contamination purposes and preparation of a draft report.

Pertinent findings from the investigation relevant to this ASSMP are presented below:

Fill:	Found in all test locations. Generally comprising sand, silty sand, clayey sand, gravelly sand, sandy gravel, silt, clay, silty clay with trace anthropogenic inclusions such as metal, glass, ceramic, plastic, brick, fibro, wire, rubber, terracotta, concrete, coal / coal chitter, ash, slag, asphalt to depths of between 0.1 m and 3.15 m bgl (refer to logs for details).
Sand / Silty Sand:	Found in most test locations beneath fill except at Bores 201A, 202A, 204, 205, 212 to 218, 301 and 303 and Pits 305 and 306. The remaining test locations terminated in this material between depths of 0.6 m to 2.7 m.

Free groundwater was observed in Pits 225, 305 and 306 at depths of 1.1 m to 2.8 m bgl (approximate RL 1.8 to RL -0.5). It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

No testing for ASS was undertaken as part of the geotechnical or contamination assessments conducted by DP.

Test pit and borehole logs from the DSI have been provided in Appendix A.

6. Potential to Oxidise Soil

Preliminary ASS testing conducted to date by Martens (2021) was limited to testing to depths up to 8.3 m depth (approximate RL -4.3). While the soils tested were found to have existing and potential acidity results below the adopted action criteria, soils at depth (in particular clayey soils) were found to have some potential for acid generation upon oxidation suggesting deeper soils or soils with higher clay contents may have higher existing and potential acidity results.

In the absence of site-specific testing at depths below 8.3 m depth (approximate RL-4.3), it is recommended that alluvial soils below this depth are considered as ASS as a precaution.

Based on available information and our understanding of the proposed development, the following activities may therefore expose ASS to oxidising conditions during construction:

- Installation of CFA piles (understood to reach depths of 8 m to 10.5 m below ground level (approximate RL -4.0 to RL -8.5)) that disturb ASS and bring spoil/cuttings to the surface;
- Excavation/dewatering of ASS for service installations or other underground infrastructure (understood to be < 2 m bgl).

The recommended management option for excavated ASS is neutralisation by full lime treatment and oxidation.

To confirm the presence and extent of ASS at depths greater than 8.3 m (~RL-4.3), site-specific investigation should be conducted to determine soil and groundwater conditions prior to the commencement of construction.

7. Management Strategy

7.1 Soil Treatment

Neutralisation of ASS may be required for natural sandy clays/clayey sands below 8.3 m (~RL -4.3). Treatment should be undertaken with reference to Dear et al (2014) and Stone, Ahern & Blunden (1998) as discussed below. It is noted that limited guidance on management of ASS is provided in the *National Acid Sulfate Soils Guidance* (Sullivan, et al., 2018).

ASS should be segregated from overlying soils including potentially contaminated fill and natural soils which are not ASS. Segregation should also be undertaken with reference to the subsurface conditions provided in the RAP, with due consideration of the contamination status of overlying soils/fill. In the case of CFA pile installation, particular procedures and equipment will be required to facilitate appropriate segregation in consultation with the piling contractor.

Excavated and segregated ASS should be treated within a suitable contained and bunded area prior to off-site disposal and/or re-use on-site.

The location of the bunded area should be selected to minimise the potential for impact on nearby sensitive receptors, including nearby water bodies (i.e., Cottage Creek and Hunter River downstream). Any leachate produced in the bunded area should be contained for monitoring and treatment as discussed below.

If a suitable located bunded area is not available on-site, consideration could be given to progressive treatment of soils immediately adjacent to the excavation as the material is excavated (i.e., treated within 4 hours of excavation).

Suitable neutralising agents for ASS include Grade 1 agricultural lime ($CaCO_3$), calcined magnesia (MgO or $Mg(OH)_2$) and dolomite ($MgCO_3.CaCO_3$), although Grade 1 agricultural lime is recommended due to the potential for dolomite and calcined magnesia to degrade water quality as a result of the soluble product magnesium sulfate produces in the process of neutralising acids.

An assessment of the dosing rate for lime treatment can be calculated from the results of detailed laboratory testing, using the following equation, which includes a factor of safety.

Alkali Material Required (kg) per unit volume of soil (m^3) =

$$\left(\frac{\%\,S \times 623.7}{19.98}\right) \times \frac{100}{ENV(\%)} \times D \times FOS$$

Where: *%S = existing and potential acidity (% S units);*
623.7 = % S to mol H^+ / t;
19.98 = mol H^+ / t to kg $CaCO_3$ / t;
D = Bulk density of soil (t/m^3);
FOS = safety factor (usually 1.5);
ENV = Effective Neutralising Value (e.g., 80% for Grade 1 Agricultural lime).

Note: *The ENV is calculated based on the molecular weight, particle size and purity of the neutralising agent and should be assessed for proposed materials in accordance with Dear SE et al (2014).*

It is recommended that Grade 1 agricultural lime is used for the neutralisation of ASS excavated during the construction.

Martens (2021) previously conducted ASS testing to a maximum depth of 8.3 m (~RL-4.3) at the site and concluded that ASS conditions were not present to the depth of testing. It is understood, however, that piling may extend deeper than the previous assessment (approximately 10.5 m (~RL-8.5)). In lieu of available ASS data for deeper soils (i.e. >8.3 m / ~RL-4.3) and based on DP's previous experience in the area, an initial liming rate of **5 to 10 kg lime/tonne (~8 to 16kg lime/m^3)** should be adopted for pile spoil generated from depths greater than 8.3 m / ~RL-4.3.

The above liming rates are based on the use of Grade 1 agricultural lime with an effective neutralising value (ENV) of 80% and an estimated bulk density of 1.8 tonne/m^3 for sands and 1.4 tonne/m^3 for excavated clays (Note: A bulk density of 1.6- tonne/m^3 has been utilised in the above estimates given the clayey sand/sandy clays encountered at depth).

Site specific testing will be required to confirm ASS conditions at depths greater than 8.3 m / ~RL-4.3, to confirm ASS conditions and where present calculate site-specific initial liming rates to minimise the risk of over-liming or unnecessary treatment. Given the preliminary nature of previous ASS testing by Martens (2021) it is also recommended that the additional sampling and testing of deeper soils also include systematic sampling and testing comprising screening testing and detailed ASS (Scr suite) testing of upper natural soils for confirmation purposes.

7.2 Liming and Monitoring Procedure

The initial liming rates should be trialled to minimise the risk of over-liming. Lime rates should be confirmed and modified as required during the works through validation testing.

The following liming / monitoring procedures for the treatment of ASS are recommended:

- The surface of the bunded soil treatment area/stockpile area adjacent to the excavation should be dosed with approximately 1 kg/m^2 of agricultural lime as a precautionary measure. If ASS are to be treated over existing concrete / asphalt pavements, treatment areas should be appropriately bunded with fill/treated ASS or hay bales etc and lined with black plastic;
- All excavated ASS should be contained within the suitably bunded area(s) and kept moist to minimise oxidation, prior to treatment with lime. Progressive neutralisation will minimise the area required for bunding;
- The neutralising agent and ASS should be thoroughly mixed and aerated using, for example, an agricultural lime spreader and excavator or rotary hoe. The soil should be treated in layers up to 300 mm thick to encourage aeration;
- Stockpiled ASS soil should be limed as soon as practicable following excavation initially at the estimated lime application rate (refer to Section 7.1). Application rates at the site may vary depending on soil conditions encountered at depths greater than 8.3 m (~RL 4.3);
- The actual lime rate required will also depend on the results of monitoring during neutralisation. Additional lime will be required if monitoring results indicate that appropriate neutralisation has not been achieved. Conversely the liming rate may decrease if monitoring suggests over-liming has occurred;

- Sampling and testing should be undertaken in accordance with Section 7.5 to verify the neutralisation treatment. The acceptance criteria are discussed in Section 7.6. Depending on the results of testing, reapplication of lime may be necessary to gain adequate neutralisation. Care should be taken to avoid over-liming of soils;
- Upon verification of treatment, the neutralised ASS could be re-used on site or disposed to a licensed landfill following confirmation of the waste classification by an appropriately qualified consultant. It is noted that ASS must be appropriately neutralised prior to off-site landfill disposal in accordance with NSW EPA *Waste Classification Guidelines - Part 4: Acid Sulfate Soils* (NSW EPA, 2014). Alternatively, the NSW EPA may assess an application for reuse of the treated soils on another site, via classification with a specific exemption. The requirements for the exemption should be confirmed prior to construction;
- The geotechnical and contamination suitability of the treated soils should be confirmed if proposed for re-use.

It is noted that there is a potential for piling spoil brought to the surface to be intermixed with concrete materials that will generally raise the soil pH and potentially neutralise ASS conditions to some degree. It is recommended that initial screening / testing of pile spoil is conducted prior to lime application to confirm liming requirements and avoid over application.

7.3 Neutralising Leachate

Leachate water collected from the bunded area(s) should be neutralised as necessary before disposal. Calcined magnesia (magnesium hydroxide, burnt magnesite, or magnesia) is the recommended neutralising agent as it produces a two-step reaction, which proceeds rapidly at acidic pH and slows down as higher pH is approached, and hence reduces the potential for over-neutralisation to occur.

The amount of neutraliser required to be added to the leachate can be calculated from the following equation:

$$\textit{Alkali Material Required (kg)} = \frac{M_{Alkali} \times 10^{-pH\ initial}}{2 \times 10^{3}} \times V$$

where: pH initial = initial pH of leachate

V = volume of leachate (litres)

M_{Alkali} = molecular weight of alkali material (g/mole)

Note: molecular weight of calcined magnesia (M_{MgO}) = 40 g/mole.

The alkali should be added to the leachate as slurry. Mixing of the slurry is best achieved using an agitator.

Any discharge / disposal of water (if required) should be conducted in accordance with statutory and regulatory requirements and site-specific approvals from Water NSW (if required).

Regular monitoring of leachate should be conducted as discussed in Section 7.5.

7.4 Dewatering

Groundwater at the site has previously been intercepted during field investigations at a depth range of 0.5 to 5.6 m bgl (DP, 2022; Martens, 2021). For the more recent DSI (DP, 2023), free groundwater was observed in Pits 225, 305 and 306 at depths of 1.1 m to 2.8 m bgl (approximate RL 1.8 to RL -0.5) which is considered more representative of typical groundwater levels.

No information has been provided regarding the potential for dewatering for the proposed development. Dewatering, if required, is expected to be localised for service trenches and shallow excavations. If dewatering activities are required for the project they should be conducted according to appropriate licencing and regulatory requirements (i.e., Hunter Water Corporation, Newcastle City Council etc) as well as the strategies provided below where dewatering is likely to disturb ASS.

Potential options for the management / disposal of extracted groundwater during dewatering include the following:

- Re-injection of groundwater at a location away from the dewatered excavation;
- Overland discharge and infiltration, or infiltration within a temporary pond/basin;
- Disposal to sewer subject to a Trade Waste agreement;
- Stormwater disposal subject to regulatory approval and appropriate water quality treatment and monitoring requirements.

The following procedure is recommended to minimise potential adverse impacts resulting from excavation and dewatering of ASS during construction:

- Minimise the dewatering depth required for installation (i.e., as close as practicable to the invert level of the excavation);
- Minimise the time and volume of exposed ASS (i.e., staged excavations and dewatering);
- If re-injection is proposed, periodic monitoring of reinjected water should be conducted to assess potential impacts from the dewatering process;
- For discharge / infiltration methods, extracted groundwater should be collected in a suitably sized multi-stage sedimentation tank or on-site detention structures and neutralised as necessary prior to disposal;
- The extracted groundwater could then be discharged to a bunded area or constructed pond/basin away from the dewatering site (i.e., reinjected or evaporation/infiltration) or discharged overland or to sewer/stormwater, subject to regulatory requirements and licences;
- Background groundwater pH was measured at 7.0 in December 2022 (DP, 2023), however, pH of the extracted water should be monitored prior to dewatering and discharge. Neutralisation should be undertaken, as discussed below, if discharge water pH falls below natural background levels for re-injection / evaporation / infiltration or outside regulatory requirements (sewer/stormwater disposal);
- Dose the base of temporary excavations (i.e., service trenches, stormwater retention etc.) at a rate of approximately 1 kg/m^2 of agricultural lime prior to construction and cessation of dewatering to counteract the generation of acidic leachate following groundwater recovery;

- Segregate and treat the ASS excavated during construction as discussed in Section 7.1 and 7.2; and
- Undertake monitoring as recommended in Section 7.5.

The following procedure is recommended for neutralising groundwater if required:

- The neutralising agent (e.g., agricultural lime or calcined magnesia) should be added as a slurry at the first stage of a multi-stage sedimentation tank or detention structure to allow the lime to mix with the extracted groundwater prior to discharge;
- The neutralising agent should be added at a constant rate during dewatering. The rate of dosing should be minimal initially and be monitored and adjusted based on the results of regular monitoring of the treated extracted groundwater.

It is noted that the above procedures should be reviewed following completion of the detailed site investigation (DSI) and preparation of a site-specific remediation action plan (RAP) to ensure the procedures are commensurate with contaminated land requirements.

7.5 Monitoring Strategies

7.5.1 Soil Neutralisation / Management

It is recommended that the following inspections and monitoring be undertaken when excavating ASS materials, based on guidelines presented in the ASSMAC (Stone, Ahern, & Blunden, 1998) and QASSIT (Ahern, McElnea, & Sullivan, 2004) manuals:

- Daily inspection of liming operations during initial excavation, to be reviewed following establishment of liming procedures;
- Sampling and testing after lime treatment (i.e., measurements of soil pH in distilled water and pH following oxidation with peroxide) should initially be undertaken at a frequency of at least one sample per 20 m^3 excavated soil to verify the neutralisation treatment. The frequency of testing could be reviewed as treatment progresses. A lower frequency of testing could be considered, subject to consistent results, soil conditions and treatment procedures;
- Analysis of soil samples for chromium suite analysis by a NATA accredited laboratory to confirm appropriate neutralisation, with sampling density in stockpiles as follows:
  - <250 m^3: two samples;
  - 250-500 m^3: three samples;
  - 500-1000 m^3: four samples.
- The frequency of testing could be reduced depending on the results of monitoring and consistency of excavated ASS.

Note: The frequency of testing would also need to comply with NSW EPA requirements in the event that a specific exemption was sought for off-site re-use of treated ASS materials.

7.5.2 Leachate Management

Leachate collected within the bunded area should be temporarily stored and neutralised as necessary. The pH of the leachate should be monitored daily, and prior to any discharge to the environment. The neutralised leachate could be discharged overland within the site (e.g., controlled evaporation/infiltration), or discharged to sewer / stormwater, subject to regulatory requirements and licences/approvals.

Neutralisation/treatment should be undertaken if discharge water pH falls below background levels if overland evaporation/infiltration is proposed, or to within regulatory requirements if discharge is proposed.

A contingency procedure should be in place to allow lime dosing and monitoring to confirm neutralisation prior to discharge.

7.5.3 Dewatering

Extracted groundwater should be temporarily stored and neutralised as necessary. The pH of extracted water associated with areas of ASS should be monitored twice daily (AM, PM) prior to discharge. The groundwater could be reinjected, discharged overland (i.e., evaporation / infiltration) as discussed in Section 7.4, or discharged to sewer or stormwater subject to regulatory requirements and licences.

Neutralisation should be undertaken if discharge water pH falls below natural background groundwater levels (re-injection / evaporation / infiltration) or outside regulatory requirements (stormwater/sewer discharge). Background groundwater pH was recorded at 7.0 from an irrigation bore in the eastern part of the site in December 2022 (DP, 2023). Construction details and depth for the irrigation bore were not known at the time of the DSI and may not to have been representative of groundwater conditions in the area (it was considered that the bore potentially contained tap/town water). Therefore, pH should be retested at the commencement of dewatering.

A contingency procedure should be in place to allow for lime dosing and monitoring confirming that neutralisation has been achieved prior to discharge.

7.5.4 Reporting

A record of treatment of ASS and leachate should be maintained by the contractor and should include the following details:

- Date;
- Location and source of material (e.g., excavation of pile spoil generation);
- Time stockpile has been exposed prior to treatment (i.e., time of excavation and backfilling);
- Neutralisation process undertaken;
- Lime rate utilised;
- Results of soil, leachate and groundwater monitoring;
- Records of ASS disposal to landfill or alternative site under a specific exemption (if applicable);
- Record of location and level placement where treated ASS has been re-used on-site (if any).

A record should also be maintained confirming contingency measures and additional treatment if undertaken. Monitoring should be commensurate with licencing and regulatory requirements.

A final report should be issued upon completion of the works presenting the monitoring regime and results to confirm that no adverse environmental impact has occurred during the works. The report shall include (where required) details of the total volume of ASS excavated, detailed analytical results confirming that acceptable ASS treatment has occurred, water monitoring results of extracted groundwater (where required), site records from contractors and records of the final disposal destination of the materials removed from site (if required).

A report will be prepared by the environmental consultant with reference to the ASSMAC (Stone, Ahern, & Blunden, 1998) and QASSIT (Ahern, McElnea, & Sullivan, 2004) guidelines as well as other appropriate guidance documentation detailing the results of ASS management during construction.

7.6 Acceptance Criteria

7.6.1 Water

Discharge of waters should be conducted in accordance with relevant statutory and regulatory requirements including ANZECC (2000) and ANZG (2018).

Measurement of pH and EC of groundwater at the commencement of construction should be conducted. These measurements in conjunction with those measured during the previous investigation summarised in Table B1 in Appendix B will be used to confirm baseline conditions at the site prior to evaporation / infiltration / re-injection at the site.

Groundwater quality should be assessed in accordance with regulatory requirements if discharge to sewer/stormwater is required.

It is noted that the ANZECC (2000) trigger value range of pH 7.0 to pH 8.5 for estuarine environments is considered to be appropriate for surface water / stormwater discharge, rather than the marine or freshwater criteria as the Hunter River is the closest surface water body receptor. pH adjustment may therefore be required for this option.

7.6.2 Soil

Further treatment of soils may be required if monitoring of the material reveals any of the following properties:

- pH_F is less than background values. Applicable background values are those present within the area proposed for re-use of treated ASS (i.e., background pH of soils within re-use areas). At the commencement of ASS construction activities, the background soil pH should be determined within the nominated re-use areas (where required);
- pH_F minus pH_{FOX} is greater than 1 and pH_F is less than background values;
- Net Acidity results are greater than zero OR the lime associated acid neutralisation capacity (ANC) <1.5 times the Existing and Potential Acidity.

Depending on the results of testing, reapplication of lime may be necessary to gain adequate neutralisation. Care should be taken to ensure over-liming does not occur.

Note: The validation testing would also need to comply with NSW EPA (2014) requirements if a specific exemption was sought for off-site re-use of treated ASS materials.

8. ASS Contingency Plan

Remedial action will be required if the standards or acceptance criteria outlined above are not being achieved. Remedial action could include but not be limited to the following:

- Mixing of additional lime through the excavated material if neutralisation does not satisfy the criteria as provided in Section 7.1;
- Additional neutralisation of leachate if under liming has occurred;
- If monitoring indicates that over-liming has occurred, additional untreated ASS or leachate should be mixed through over-limed soils to reduce pH to acceptable levels. The required mixing rate to remediate the soil or leachate should be confirmed by monitoring tests;
- Cessation of dewatering discharge if monitoring indicates groundwater conditions are outside background values and regulatory requirements (dependent upon the discharge option). Should dewatering discharge be restricted, contingency would include collection, treatment and/or disposal of extracted groundwater to a licensed facility.

During periods of heavy or prolonged rainfall, stockpiled soils should be appropriately contained/covered or temporarily backfilled to minimise leachate generation and runoff.

Sufficient lime should be stored on site during construction for the neutralisation of ASS and contingency measures.

The development should be conducted with due regard to erosion and sediment controls to minimise potential impacts to nearby sensitive receptors, including stormwater drains.

Management of ASS during construction should be conducted by an experienced contractor in accordance with regulatory and statutory requirements. Validation of ASS management should be conducted by an experienced and qualified environmental consultant.

9. References

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Dear, S., Ahern, C., O'Brien, L., Dobos, S., McElnea, A., Moore, N., & Watling, K. (2014). *Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines.* Brisbane: Department of Science: Department of Science, Information, Technology, Innovation and the Arts, Queensland Government.

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Stone, Y., Ahern, C. R., & Blunden, B. (1998). *Acid Sulfate Soil Manual.* Acid Sulfate Soil Management Committee (ASSMAC).

Sullivan, L., Ward, N., Toppler, N., & Lancaster, G. (2018). *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual.* Canberra ACT CC BY 4.0: Department of Agriculture and Water Resources.

10. Limitations

Douglas Partners (DP) has prepared this report for this project at 25a National Park Street, Newcastle West with reference to DP's proposal 213618.02.P.001.Rev0 dated 15 June 2022 and approved variation and acceptance received from School Infrastructure. The work was carried out under Part D – Standard Form Agreement (SINSW03434/22) dated 21 July 2022. This report is provided for the exclusive use of School Infrastructure NSW for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after field testing has been completed.

DP's advice is based upon the conditions encountered during previous investigation by DP and others. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental and groundwater components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About This Report
Terminology, Symbols and Abbreviations
Soil Descriptions
Sampling, Testing and Excavation Methodology
Rock Descriptions
Cone Penetration Testing
Cone Penetration Tests (CPT 101 to 107) – DP (2022)
Borehole Logs (Bores 1a, 5a and 107a) – DP (2022)
Borehole Log (Bore 4) – DP (2022)
Borehole Logs (Bores 201A to 220 and 301 to 303) – DP (2023)
Test Pit Logs (304 to 316) – DP (2023)

About this Report

August 2020

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Terminology, Symbols and Abbreviations

August 2020

Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style `XW`. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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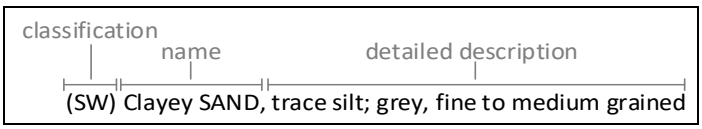
Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:



The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence it's behaviour. The detailed description presents more information about the soil's composition, condition, structure, and origin.

Classification, naming and description of soils requires the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Fraction	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on it's influence over the soils behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to it's engineering properties	All other components	All other components

[1] – As defined in AS1726-2017 6.1.4.4

[2] – in the detailed material description, minor components are split into two further sub categories. Refer "identification of minor components" below

Composite Materials

In certain situations a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example "INTERBEDDED Silty CLAY AND SAND".

Classification

The soil classification comprises a two character group symbol. The first symbol identifies the primary component. The second symbol identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component[1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	clay/silt: 0-5% sand/gravel: 0-15%

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular particle size with the range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

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Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	<PL
	Near plastic limit	Can be moulded	≈PL
	Wet of plastic limit	Water residue remains on hands when handling	>PL
	Near liquid limit	"oozes" when agitated	≈LL
	Wet of liquid limit	"oozes"	>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Rock

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered rock origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description

Quantitative engineering performance of these materials may be determined by laboratory testing, or estimated by correlated field tests (for example penetration or shear vane testing), or by tactile methods, as appropriate.

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	ST
Very stiff	Indented by thumbnail	>100 - ≤200	VST
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	FR

Relative Density (coarse grained soils)

Tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15-≤35	L
Medium dense	>35-≤65	MD
Dense	>65-≤85	D
Very dense	>85	VD

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MCE
Weakly cemented	WKCE
Cemented	CE
Strongly bound	SB
Weakly bound	WB
Unbound	UB

Extremely Weathered Rock

AS1726-2017 considers weathered rock material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. very low strength rock). These materials may be identified as "extremely weathered rock" in reports and by the abbreviation code XWR on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RES
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LCS
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or sea shore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

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Rock Strength

Rock strength is defined by the unconfined compressive strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $I_{s(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Unconfined Compressive Strength (MPa)	Point Load Index[1] $I_{s(50)}$ MPa	Abbreviation Code
Very low	0.6 - 2	0.03 - 0.1	VL
Low	2 - 6	0.1 - 0.3	L
Medium	6 - 20	0.3 - 1.0	M
High	20 - 60	1 - 3	H
Very high	60 - 200	3 - 10	VH
Extremely high	>200	>10	EH

[1] Assumes a ratio of 20:1 for UCS to $I_{s(50)}$. It should be noted that the UCS to $I_{s(50)}$ ratio varies significantly for different rock types and specific ratios may be required for each site.

On investigation logs only, the following data contiguity codes may be in rock strength tables for layers or seams of material "within rock", but for which the equivalent UCS strength is less than 0.6 MPa.

Scenario	Abbreviation Code
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The properties of the material encountered over this interval are described in the "Description of Strata" and soil properties columns.	SOIL
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The prominence of the material is such that it can be considered to be a seam (as defined in Table 22 of AS1726-2017) and the properties of the material are described in the defect column.	SEAM

Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil[1,2]	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.	RS
Extremely weathered[1,2]	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible	XW
Highly weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.	HW
Moderately weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.	DW

[1] – AS1726-2017 6.1.9 provides similar definitions for "residual soil" and "extremely weathered material" as soil origins. Generally, the soil origin terms would be used above the depth at which very low strength or stronger rock material is first encountered, while both soil origin and weathering should may be stated for soil encountered below the first contact with rock material, where appropriate.

[2] –The parent rock type, of which the residual/extremely weathered material is a derivative, will be stated in the description (where discernible).

Degree of Alteration

The degree of alteration of the rock material (physical or chemical changes caused by hot gasses or liquids at depth) is classified as follows:

Term	Description	Abbreviation Code
Extremely altered	Material is altered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.	XA
Highly altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is changed by alteration. Some primary minerals are altered to clay minerals. Porosity may be increased by leaching, or may be decreased due to precipitation of secondary materials in pores.	HA
Moderately altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MA
Slightly altered	Rock is slightly discoloured but shows little or no change of strength from fresh rock	SA
Note: If HA and MA cannot be differentiated use DA (see below)		
Distinctly altered	Rock strength usually changed by alteration. The rock may be highly discoloured, usually by staining or bleaching. Porosity may be increased by leaching, or may be decreased due to precipitation of secondary minerals in pores.	DA

Degree of Fracturing

The following descriptive classification apply to the spacing of natural occurring fractures in the rock mass. It includes bedding plane partings, joints and other defects, but excludes drilling breaks. These terms are generally not required on investigation logs where fracture spacing is presented as a histogram, and where used are presented in an unabbreviated format.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

These terms may be used to describe the spacing of bedding partings in sedimentary rocks. Where used, these terms are generally presented in an unabbreviated format

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Clay seam	CS
Cleavage	CV
Crushed zone	CZ
Decomposed seam	DS
Fault	F
Joint	J
Lamination	LAM
Parting	PT
Sheared zone	SZ
Vein	VN
Drilling/handling break	DB , HB
Fracture	FCT

Rock Defect Orientation

Term	Abbreviation Code
Horizontal	H
Vertical	V
Sub-horizontal	SH
Sub-vertical	SV

Rock Defect Coating

Term	Abbreviation Code
Clean	CLN
Coating	CO
Healed	HE
Infilled	INF
Stained	STN
Tight	TI
Veneer	VEN

Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLY
Iron oxide	FE
Manganese	MN
Silty	SLT

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Rock Defect Shape/Planarity

Term	Abbreviation Code
Curved	CU
Irregular	IR
Planar	PL
Stepped	ST
Undulating	UN

Rock Defect Roughness

Term	Abbreviation Code
Polished	PO
Rough	RO
Slickensided	SL
Smooth	SM
Very rough	VR

Other Rock Defect Attributes

Term	Abbreviation Code
Fragmented	FG
Band	BND
Quartz	QTZ

Defect Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

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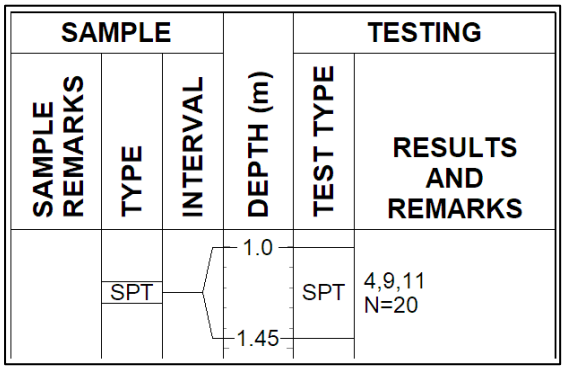
Sampling, Testing and Excavation Methodology

August 2020

Sampling and Testing

A record of samples retained and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Sample from SPT test	SPT
Environmental sample	E
Gas sample	G
Jar sample	J
Undisturbed tube sample	U[1]
Water sample	W
Piston sample	P
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kpa)	PP
Photo ionisation detector	PID
Standard Penetration Test	SPT
Shear vane (kpa)	V
Unconfined compressive strength, (MPa)	UCS
Point load test, axial (A), diametric (D), irregular (I)	PLT(_)

Field and laboratory testing (continued)

Test Type	Code
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	Observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Excavator/backhoe bucket	B[1]
Toothed bucket	TB[1]
Mud/blade bucket	MB[1]
Ripping tyne/ripper	RT
Rock breaker/hydraulic hammer	RB
Hand auger	HA[1]
NMLC series coring	NMLC
HMLC series coring	HMLC
NQ coring	NQ
HQ coring	HQ
PQ coring	PQ
Push tube	PT [1]
Rock roller	RR[1]
Solid flight auger. Suffixes (TC) and (V) indicate tungsten carbide or v-shaped tip respectively	SFA[1]
Sonic drilling	SON[1]
Vibrocore	VC[1]
Wash bore (unspecified bit type)	WB[1]
Existing exposure	X
Hand tools (unspecified)	HT
Predrilled	PD
Specialised bit (refer report)	SPEC[1]
Diatube	DT[1]
Hollow flight auger	HFA[1]
Vacuum excavation	VE

[1] – numeric suffixes indicate tool diameter/width in mm

CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGH SCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

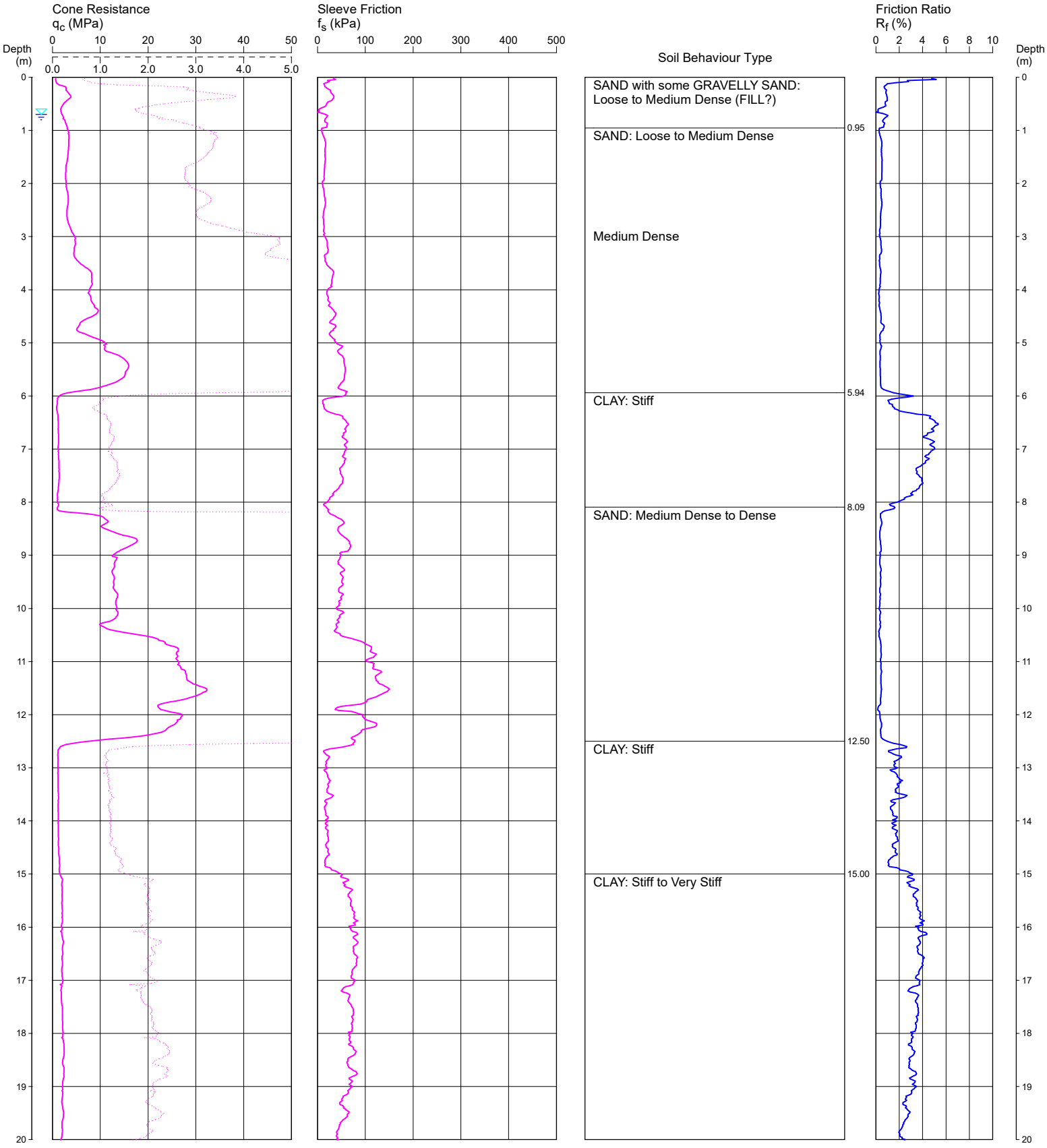
REDUCED LEVEL: 2.6

COORDINATES: 384035.8E 6355583.4N AHD

CPT101

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO SUDDEN BEND ON HARD MATERIAL
GROUNDWATER LEVEL OBSERVED AT 0.7M AFTER WITHDRAWAL OF RODS

Water depth after test: 0.70m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT101.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

Douglas Partners
Geotechnics | Environment | Groundwater

CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGH SCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

REDUCED LEVEL: 2.6

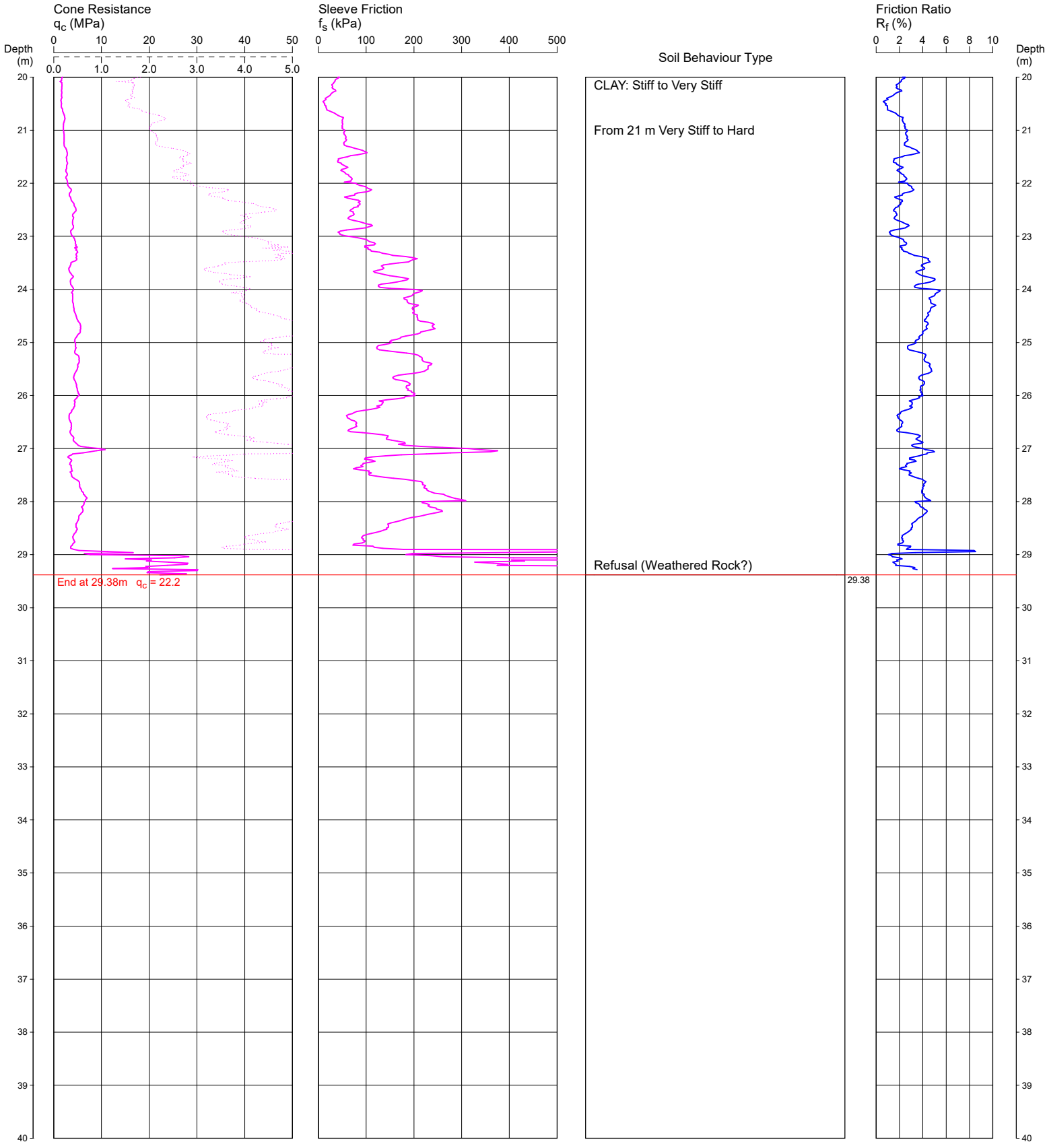
COORDINATES: 384035.8E 6355583.4N AHD

CPT101

Page 2 of 2

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO SUDDEN BEND ON HARD MATERIAL
GROUNDWATER LEVEL OBSERVED AT 0.7M AFTER WITHDRAWAL OF RODS

Water depth after test: 0.70m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT101.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

Douglas Partners
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CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGHSCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

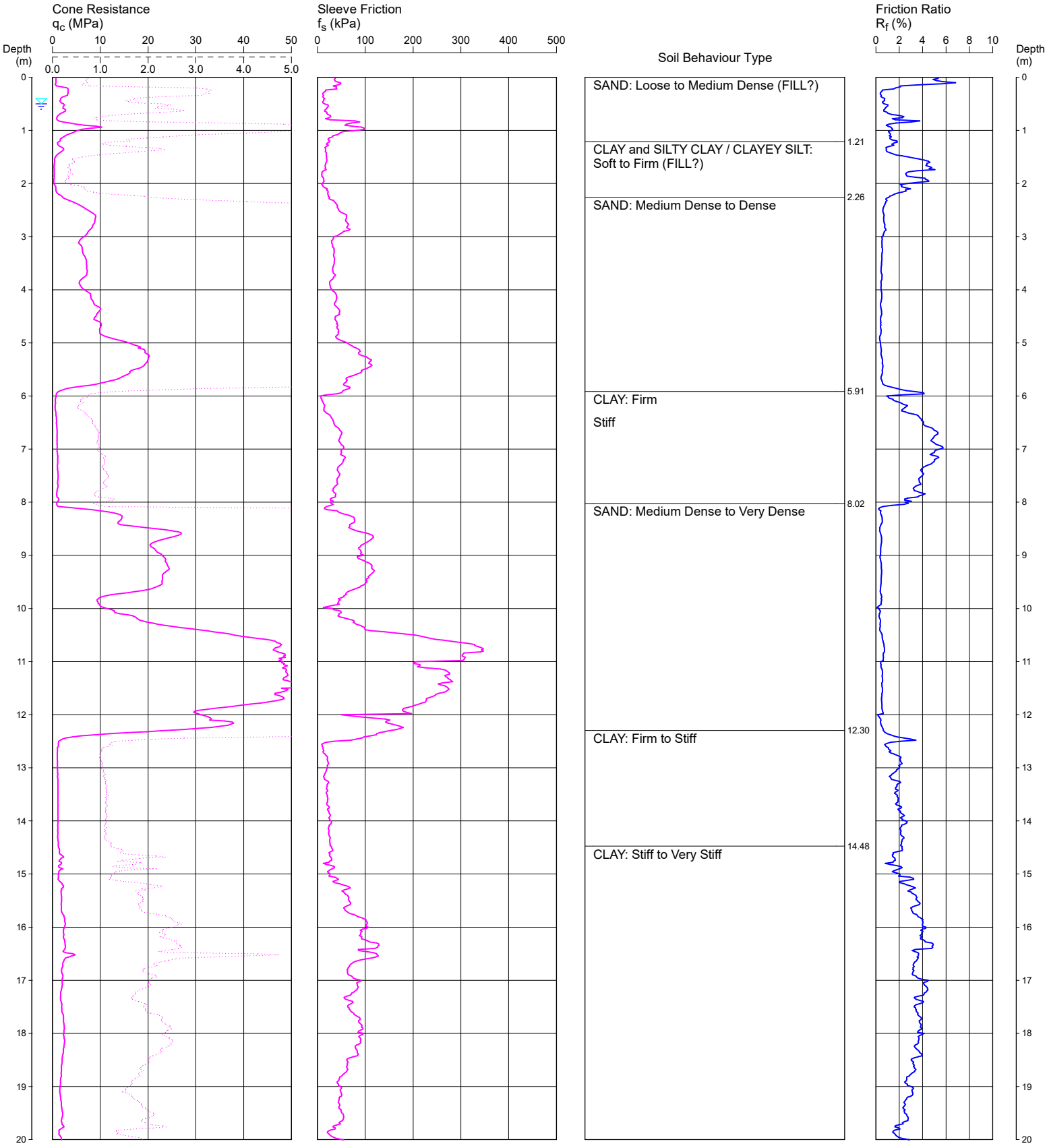
REDUCED LEVEL: 2.3

COORDINATES: 384014.1E 6355610.4N AHD

CPT102

DATE 14/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE ROD BOWING IN INFERRED WEATHERED ROCK
GROUNDWATER LEVEL OBSERVED AT 0.5M AFTER WITHDRAWAL OF RODS

Water depth after test: 0.50m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT102.CP5
Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

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CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGHSCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

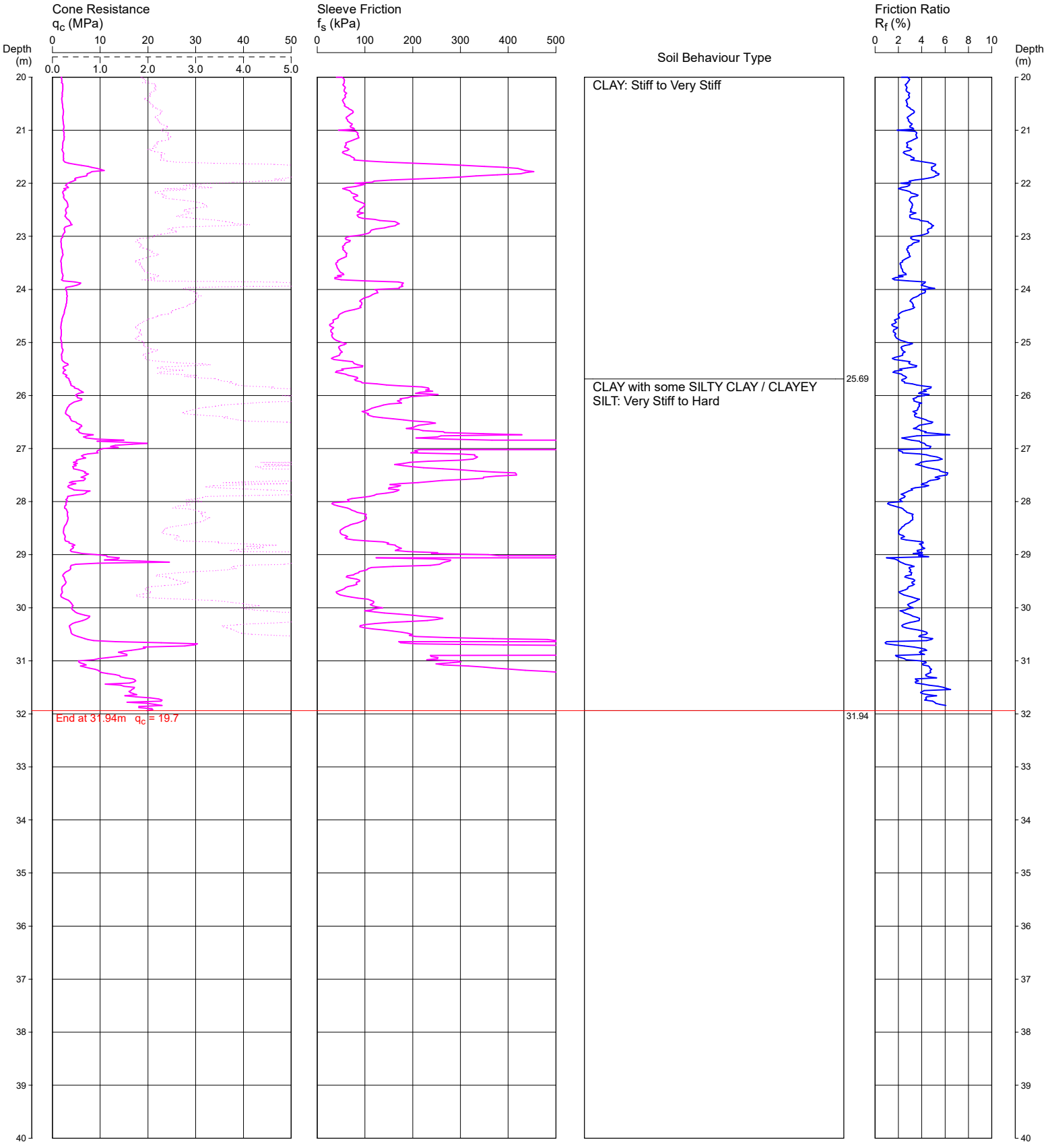
REDUCED LEVEL: 2.3

COORDINATES: 384014.1E 6355610.4N AHD

CPT102

DATE 14/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE ROD BOWING IN INFERRED WEATHERED ROCK
GROUNDWATER LEVEL OBSERVED AT 0.5M AFTER WITHDRAWAL OF RODS

Water depth after test: 0.50m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT102.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

Douglas Partners
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CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGHSCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

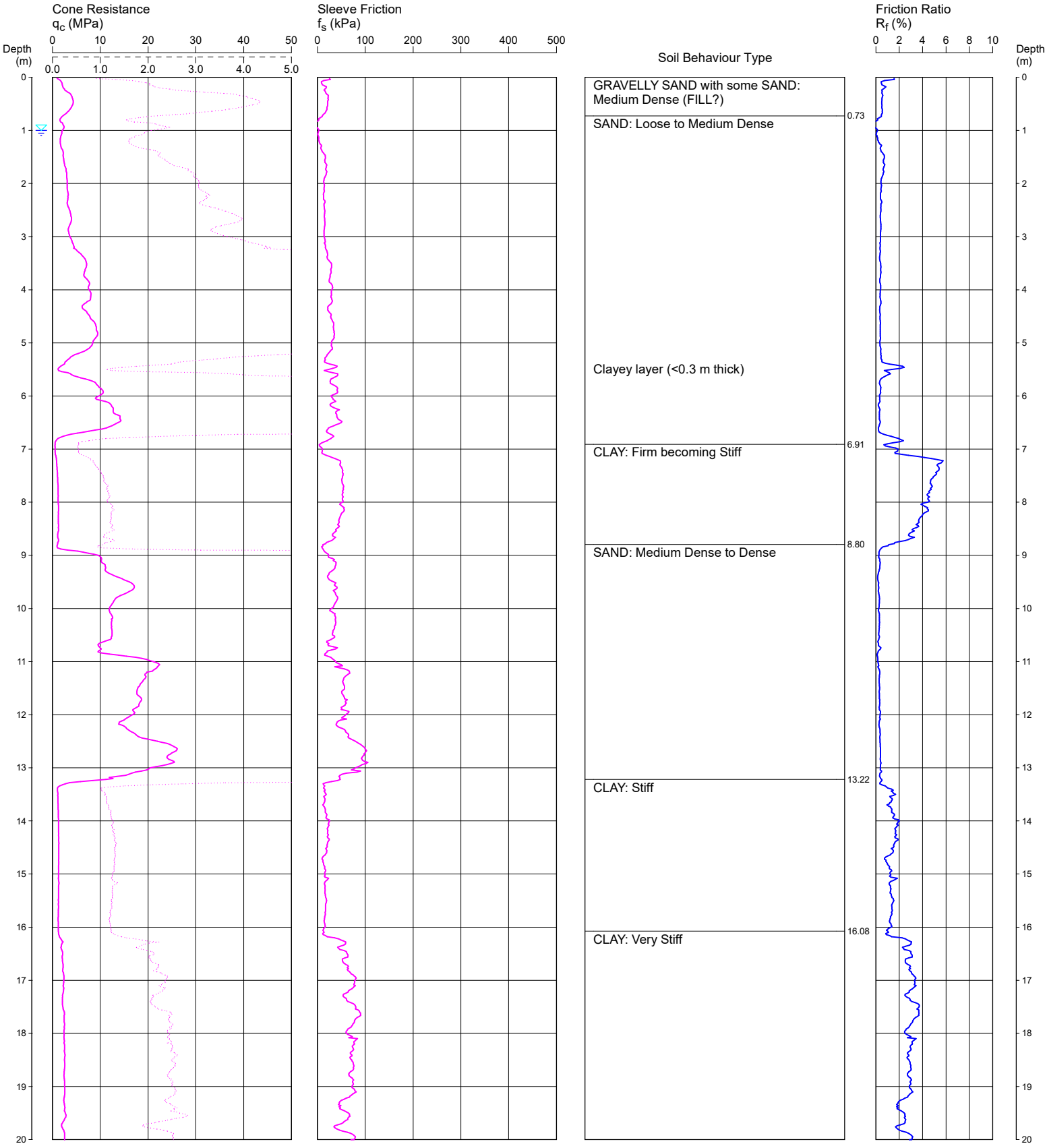
REDUCED LEVEL: 3.3

COORDINATES: 383991.2E 6355578.0N AHD

CPT103

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO SUDDEN BEND ON HARD MATERIAL
GROUNDWATER LEVEL OBSERVED AT 1.0M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.00m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT103.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

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CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGHSCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

REDUCED LEVEL: 3.3

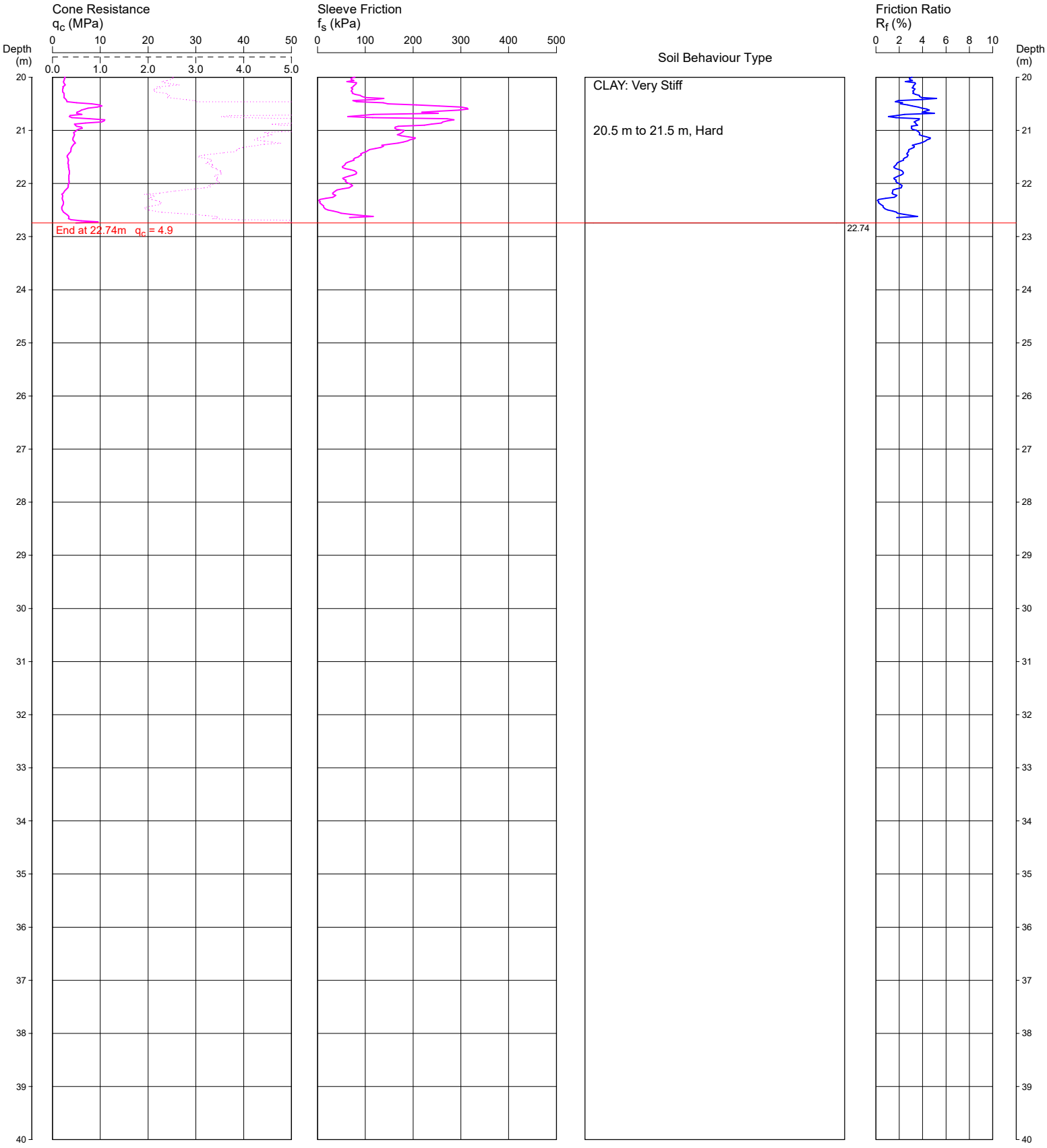
COORDINATES: 383991.2E 6355578.0N AHD

CPT103

Page 2 of 2

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO SUDDEN BEND ON HARD MATERIAL
GROUNDWATER LEVEL OBSERVED AT 1.0M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.00m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT103.CP5
Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

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CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGH SCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

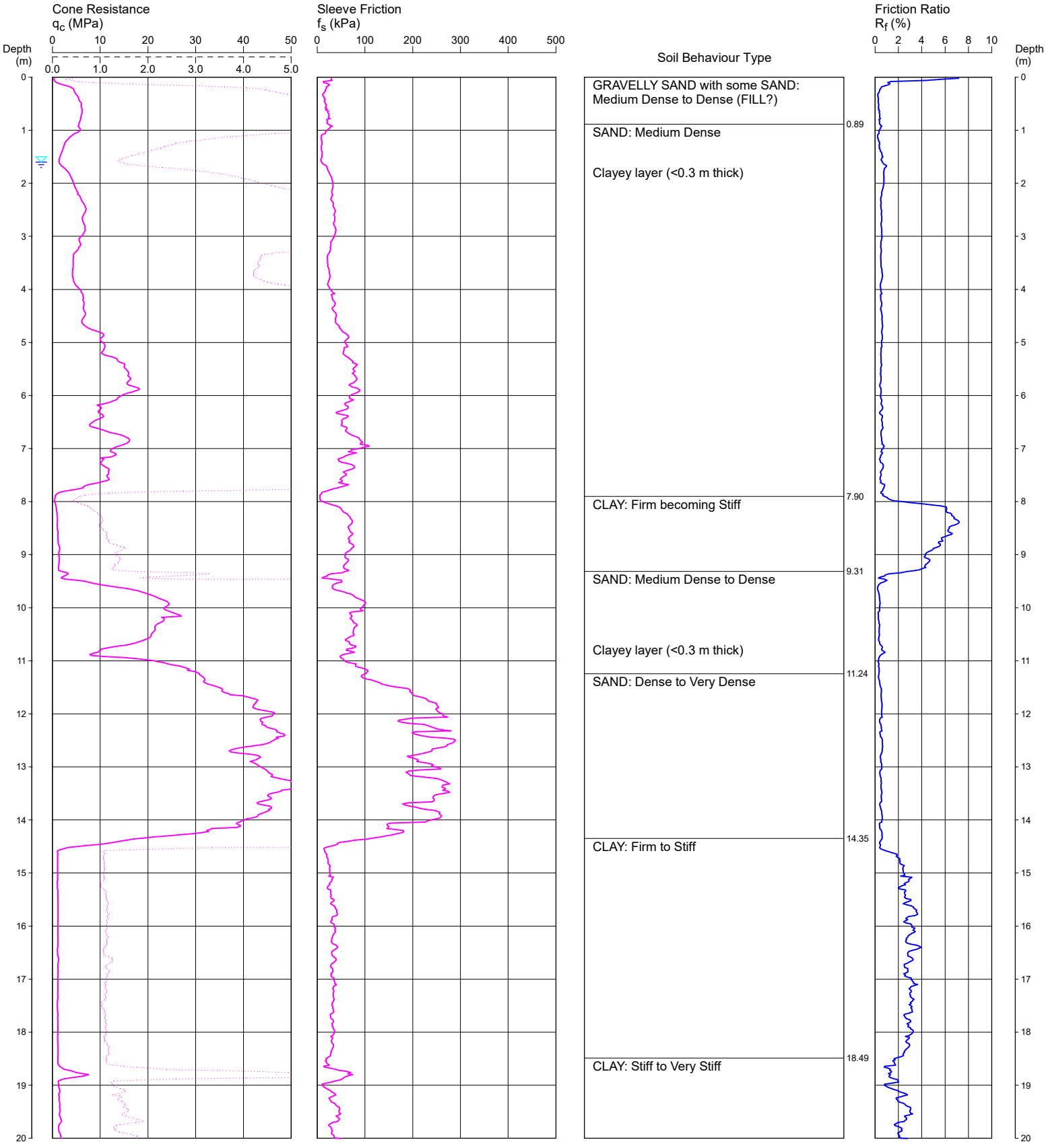
REDUCED LEVEL: 4.1

COORDINATES: 383825.6E 6355634.9N AHD

CPT104

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE ROD BOWING IN INFERRED WEATHERED ROCK
GROUNDWATER LEVEL OBSERVED AT 1.6M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.60m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT104.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

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CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGH SCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

REDUCED LEVEL: 4.1

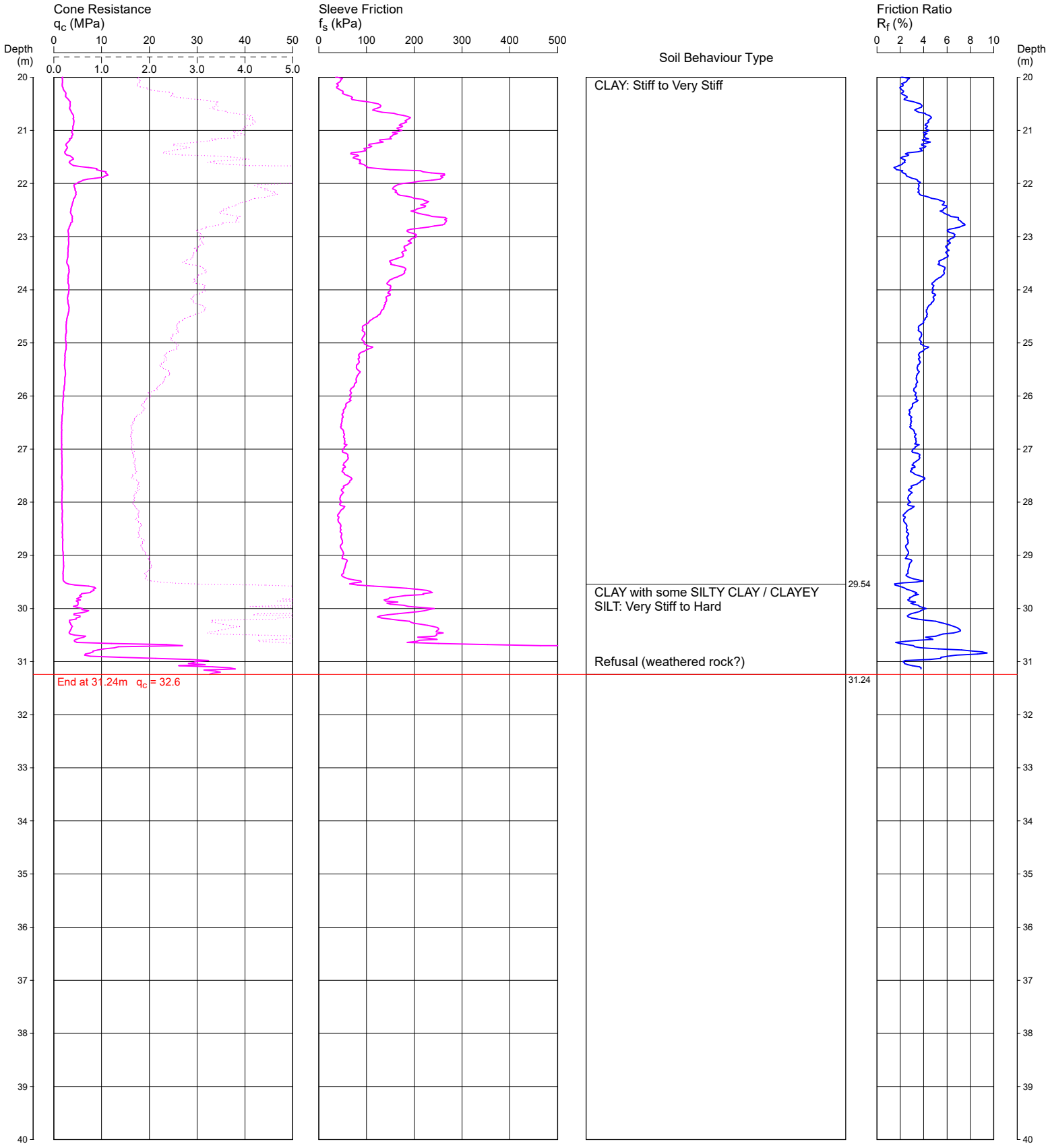
COORDINATES: 383825.6E 6355634.9N AHD

CPT104

Page 2 of 2

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE ROD BOWING IN INFERRED WEATHERED ROCK
GROUNDWATER LEVEL OBSERVED AT 1.6M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.60m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT104.CP5
Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

Douglas Partners
Geotechnics | Environment | Groundwater

CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGH SCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

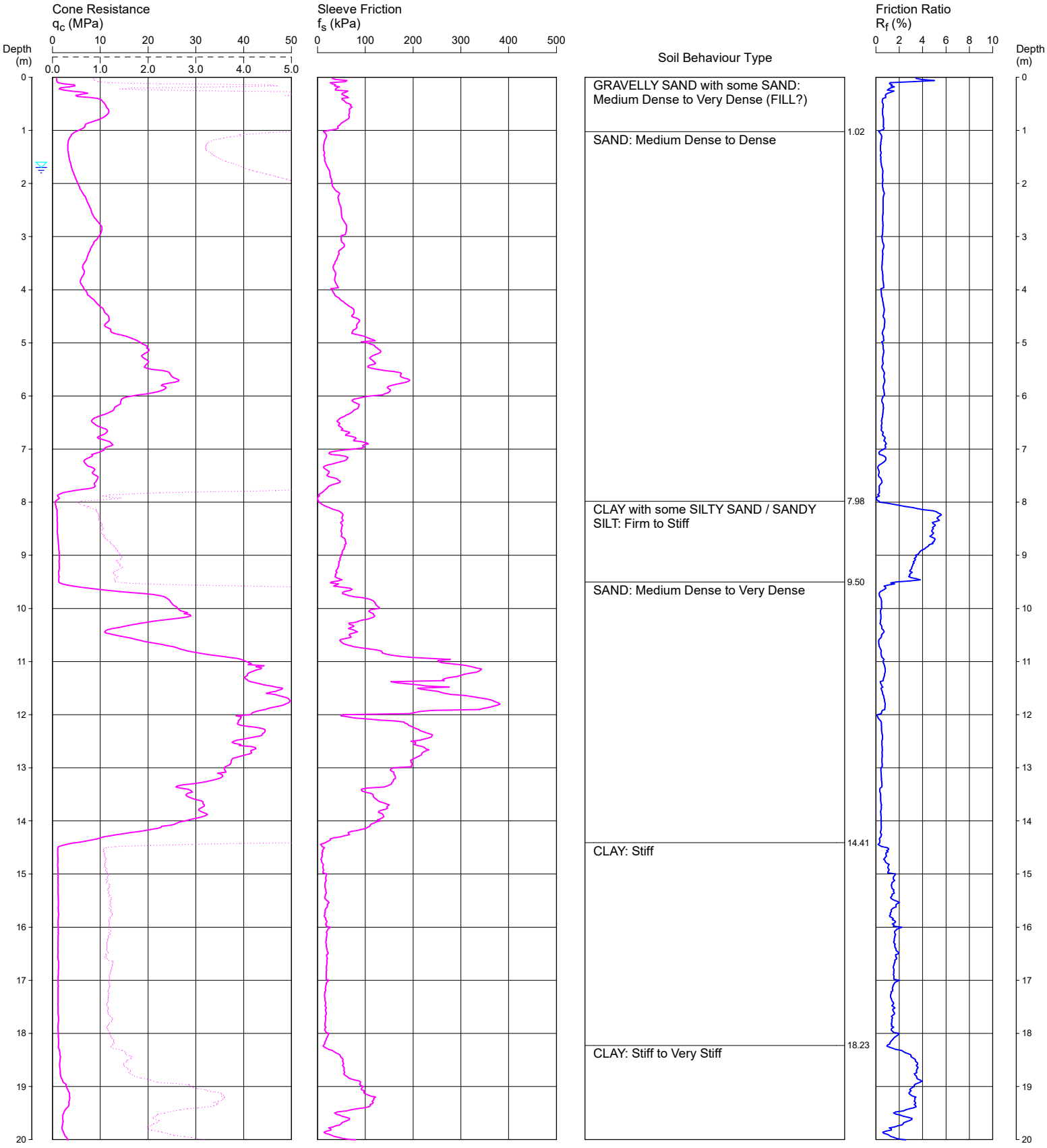
REDUCED LEVEL: 4.1

COORDINATES: 383849.0E 6355627.1N AHD

CPT105

DATE 14/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE ROD BOWING IN INFERRED WEATHERED ROCK
GROUNDWATER LEVEL OBSERVED AT 1.7M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.70m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT105.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

Douglas Partners
Geotechnics | Environment | Groundwater

CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGH SCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

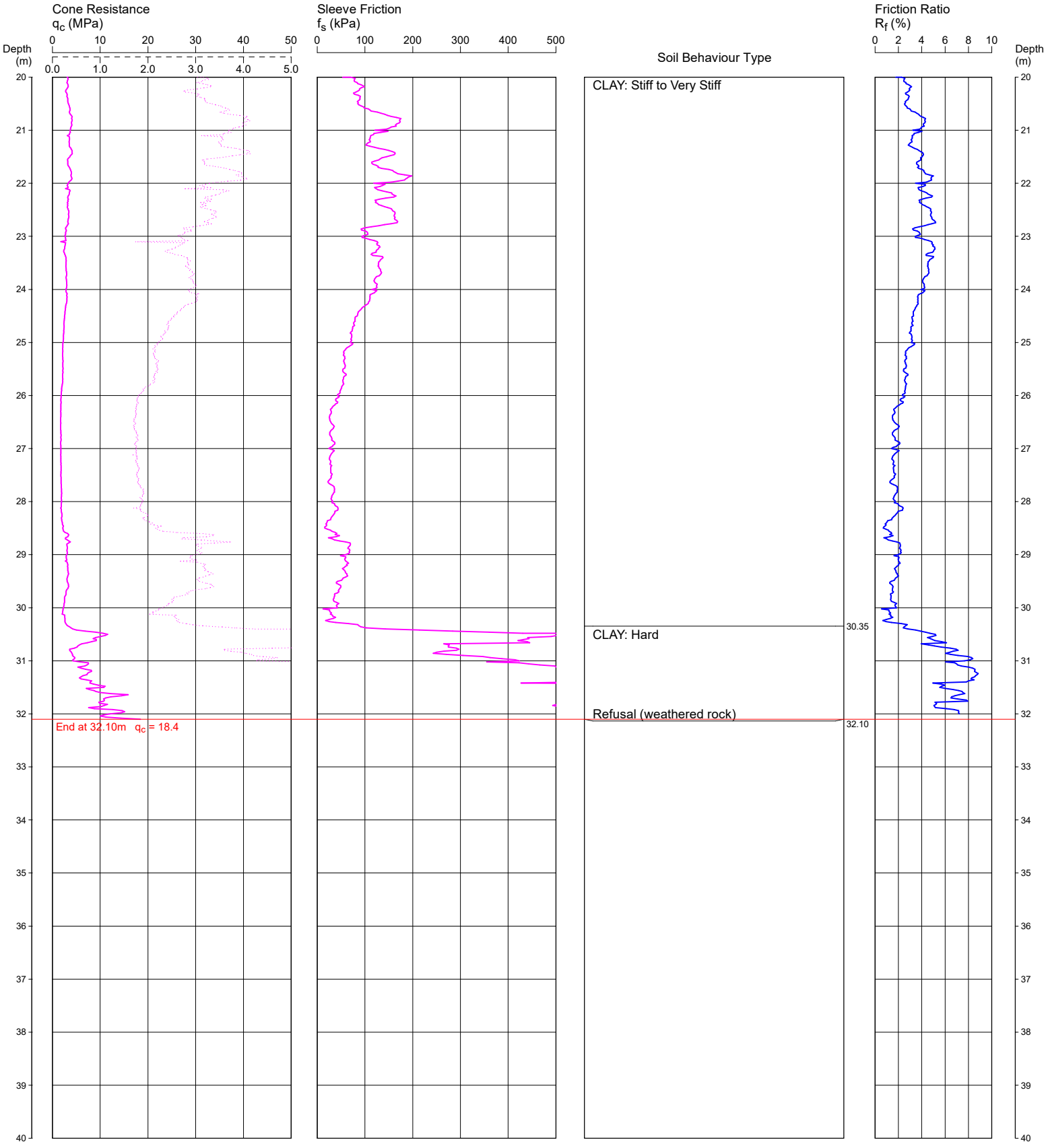
REDUCED LEVEL: 4.1

COORDINATES: 383849.0E 6355627.1N AHD

CPT105

DATE 14/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE ROD BOWING IN INFERRED WEATHERED ROCK
GROUNDWATER LEVEL OBSERVED AT 1.7M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.70m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT105.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

Douglas Partners
Geotechnics | Environment | Groundwater

CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGHSCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

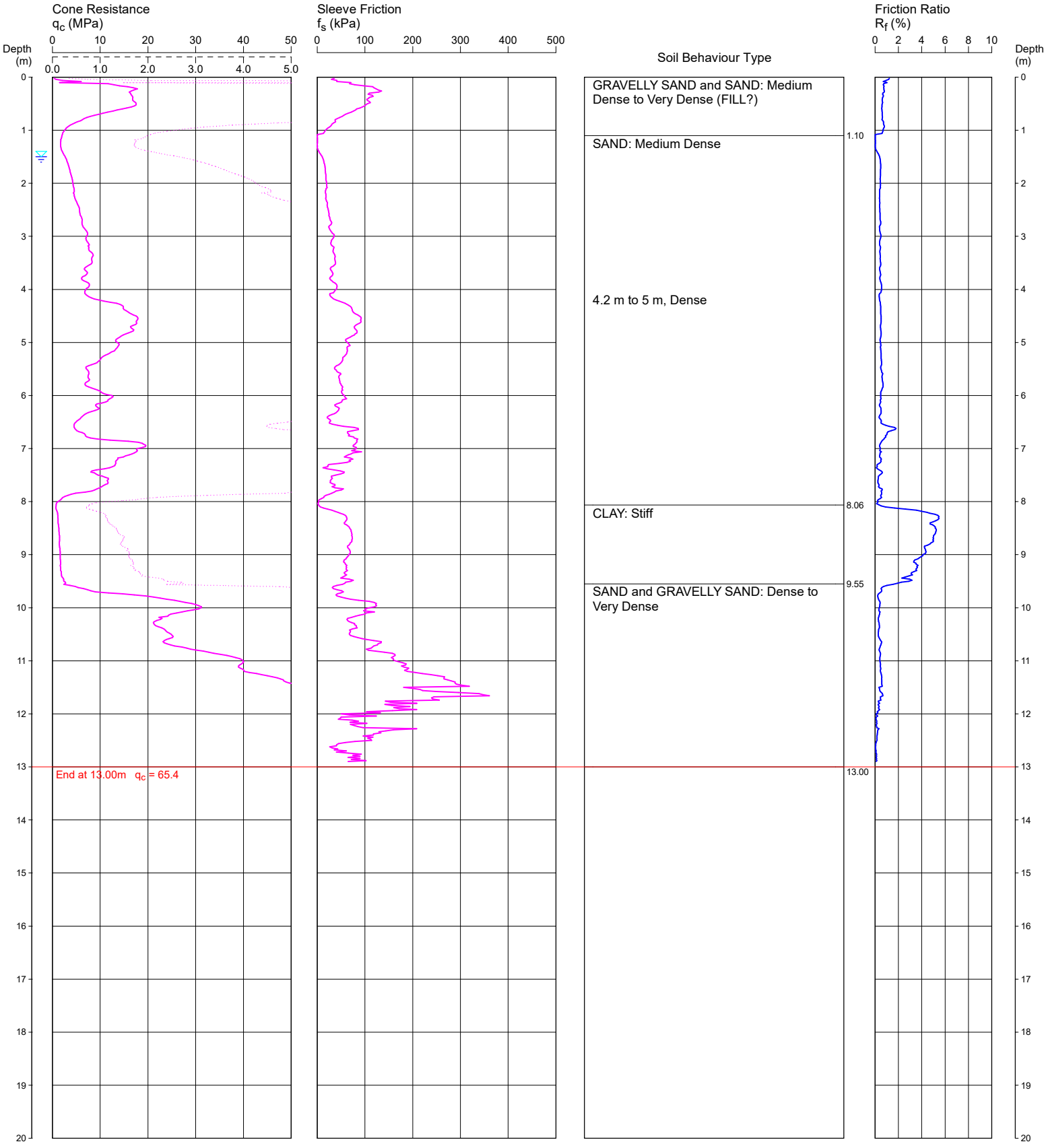
REDUCED LEVEL: 4.0

COORDINATES: 383803.1E 6355604.1N AHD

CPT106

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE BENDING IN VERY DENSE SANDS. ASPHALT 30MM THICK. GROUNDWATER LEVEL OBSERVED AT 1.5M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.50m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT106.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

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CONE PENETRATION TEST

CLIENT: SCHOOL INFRASTRUCTURE NSW

PROJECT: NEWCASTLE HIGH SCHOOL UPGRADE

LOCATION: 160-200 PARKWAY AVENUE, HAMILTON SOUTH

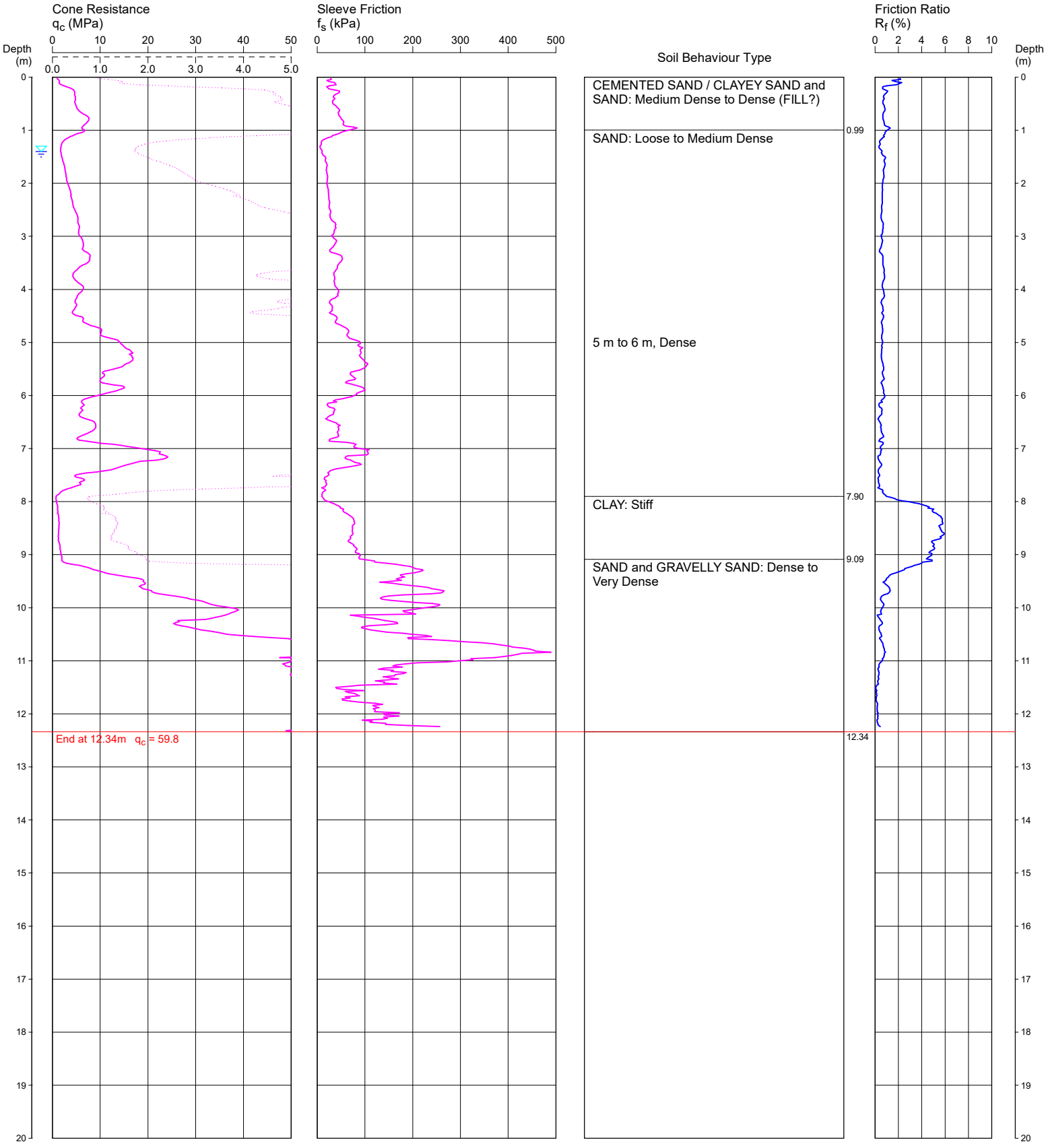
REDUCED LEVEL: 3.9

COORDINATES: 383822.5E 6355565.9N AHD

CPT107

DATE 13/07/2022

PROJECT No: 213618.01



REMARKS: TEST DISCONTINUED DUE TO EXCESSIVE BENDING IN VERY DENSE SANDS
GROUNDWATER LEVEL OBSERVED AT 1.4M AFTER WITHDRAWAL OF RODS

Water depth after test: 1.40m depth (measured)

File: P:\213618.01 - HAMILTON SOUTH, Newcastle High Drilling\4.0 Field Work\CPT Logs\CPT107.CP5

Cone ID: 170705 **Type:** I-CFXY-10

ConePlot Version 5.9.2

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.2 AHD
COORDINATE E:383998 **N:** 6355595.5
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 1a
PROJECT No: 213618.01
DATE: 08/07/22
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
	3	0.0	FILL/ (ML) Sandy SILT; dark brown; silt fraction fine; sand fraction fine to medium; trace rootlets and organics		FILL	NA	<PL		D		0.0		
		0.15	FILL/ (GP) Sandy GRAVEL; dark brown black; gravel fraction fine to medium; sand fraction fine to coarse; with white inclusions, slag with coal		FILL	NA	M		D		0.1 / 0.15		
		0.25	(SP) SAND, with silt; grey brown		ALV	MD	M		D		0.25 / 0.3 / 0.4		
		0.5	(SP) SAND; pale grey		ALV	MD	M to W		D		0.6 / 0.8		
		0.85	(SP) SAND, with silt, trace gravel; pale brown; gravel fraction fine to medium, sub-rounded		ALV	MD	M to W		D		0.9 / 1		
		1	0.95-1.1m: brown										
		1.1	Borehole discontinued at 1.10m depth partial bore collapse from 0.7m								1.1	PSP/150	5 10 15
	2	2									2		
	1												

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Push Tube Rig
METHOD: PT to 1.1m
REMARKS: Groundwater likely between 0.5m and 0.8m depth

OPERATOR: Chaplin
CASING:

LOGGED: Chaplin

EXPORTED 05/09/22 13:51. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.1 AHD
COORDINATE **E:**383845 **N:** 6355630
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 5a
PROJECT No: 213618.01
DATE: 08/07/22
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE / RESULTS AND REMARKS
	4	0.0	FILL/ (ML) Sandy SILT; dark brown; low plasticity; trace rootlets and organics		FILL	NA	<PL					
		0.1	FILL/ (ML) Sandy SILT; dark brown; silt fraction low plasticity; sand fraction fine to medium 0.2-0.3m: with concrete rubble		FILL	NA	<PL to =PL					
		0.3	(SP) SAND, with silt; grey; fine to medium 0.35-0.4m: with fine gravel (SR)		ALV	D	M		D		0.5 0.6	
		0.7	(SP) SAND; pale grey; fine to medium		ALV	MD	M					
		0.9	(SP) SAND, with silt; brown; fine to medium		ALV	MD	M		D		0.9 1.0	
	3	1.0	(SP) SAND; grey; fine to medium 1.2-1.3m: with fine to medium gravel (SR)		ALV	MD	M		D		1.2 1.3	
		1.3	(SP) SAND, with clay; brown dark brown; sand fraction fine to medium; clay fraction fine to medium, sub-rounded		ALV	MD	M					
		1.5	(SP) SAND; pale grey yellow; fine to medium		ALV	MD	M to W					
	2	2							D		1.9 2	
		2.1	Borehole discontinued at 2.10m depth Virtual refusal due to hole collapse at 2.1m								2.1	

TESTING AND REMARKS: PSP/150 — 5 10 15

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: PTR
METHOD: PT to 2.1m
REMARKS:

OPERATOR: Chaplin
CASING:

LOGGED: Chaplin

EXPORTED 27/07/22 11:32. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4 AHD
COORDINATE **E:**383821.8 **N:** 6355566.4
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 107a
PROJECT No: 213618.01
DATE: 08/07/22
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)
No free groundwater observed		0.0	FILL/ (ML) Sandy SILT; dark brown; silt fraction fine; sand fraction fine to medium; with trace rootlets and organics		FILL	NA	<PL		D		0.0
		0.15	(SP) SAND, with silt; grey; fine to medium		ALV	MD	M		D		0.1
		0.5	(SP) SAND; pale grey; fine to medium		ALV	MD	M		D		0.3
		0.8	(SP) SAND, with silt, trace gravel; dark brown; sand fraction fine to medium; gravel fraction fine to medium, sub-rounded		ALV	MD	M		D		0.4
	3	1							D		0.6
		1.1	(SP) SAND; pale grey; fine to medium		ALV	MD	M		D		0.7
		1.2	(SP) SAND, with silt, trace gravel; grey; sand fraction fine to medium; gravel fraction fine to medium, sub-rounded		ALV	MD	M to W		D		0.9
		1.4	(SP) SAND; pale grey yellow; fine to medium		ALV	MD	M to W		D		1.0
	2	2	1.8-2.2m: pale grey						D		1.3
		2.2	Borehole discontinued at 2.20m depth Virtual refusal due to hole collapse at 1.2m						D		1.4
									D		1.5
											1.6
									D		2.0
											2.2

TESTING AND REMARKS

TEST TYPE: PSP/150

RESULTS AND REMARKS: 5 | 10 | 15

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: PTR
METHOD: PT to 2.2m
REMARKS: Groundwater likely between 1.2m and 1.4m depth

OPERATOR: Butcher
CASING:

LOGGED: Chaplin

EXPORTED 27/07/22 11:32. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4 AHD
COORDINATE **E:**383791 **N:** 6355598
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 4
PROJECT No: 213618.01
DATE: 06/07/22
SHEET: 2 of 7

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA (SOIL STRENGTH (where encountered), SOIL MOISTURE)	GRAPHIC	WEATH. (RS, XW, HW, DW, MW, SW, FS, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.01, 0.05, 0.10, 0.50, 1.00, 5.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
1.5	-7	11	Silty CLAY; medium plasticity *(continued)*												11		
	-8	12													12		
	-9	13													13		
	-10	14	13.5 Clayey SAND; fine to medium												14		
	-11	15	14.75 Silty CLAY; dark grey												15		
	-12	16													16		
	-13	17													17		
	-14	18													18		
	-15	19													19		

NOTES: (#)Soil origin is "probable" unless otherwise stated.

PLANT: Hanjin 114
OPERATOR: Total Drilling
LOGGED: Millard

METHOD: SFA to 2.5m, then PD to 33.3m, then HQ core to 62.0m
CASING: PQ to 2.5m, HWT to 36.2m

REMARKS: Soil description and depths are based on drillers logs. Information on soil should be obtained fron nearby Cone Penetration Tests (CPT)

EXPORTED 03/08/22 10:14. TEMPLATE ID: DP_102.02.00_ROCKLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4 AHD
COORDINATE E:383791 **N:** 6355598
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 4
PROJECT No: 213618.01
DATE: 06/07/22
SHEET: 3 of 7

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA (SOIL STRENGTH (where encountered) / SOIL MOISTURE)	GRAPHIC	WEATH. (RS, XW, HW, DW, MW, SW, FS, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.01, 0.05, 0.10, 0.50, 1.00, 5.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
1.5	-17	21	Silty CLAY; dark grey *(continued)*												21		
	-18	22													22		
	-19	23													23		
	-20	24													24		
	-21	25													25		
	-22	26													26		
	-23	27													27		
	-24	28													28		
	-25	29													29		

NOTES: (#)Soil origin is "probable" unless otherwise stated.

PLANT: Hanjin 114
OPERATOR: Total Drilling
LOGGED: Millard

METHOD: SFA to 2.5m, then PD to 33.3m, then HQ core to 62.0m
CASING: PQ to 2.5m, HWT to 36.2m

REMARKS: Soil description and depths are based on drillers logs. Information on soil should be obtained fron nearby Cone Penetration Tests (CPT)

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4 AHD
COORDINATE E:383791 **N:** 6355598
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 4
PROJECT No: 213618.01
DATE: 06/07/22
SHEET: 4 of 7

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	SOIL STRENGTH (where encountered) / SOIL MOISTURE	GRAPHIC	WEATH. (RS, XW, HW, MW, SW, FS, FR; DW)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.01, 0.05, 0.10, 0.50, 1.00, 5.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
1.5	-27	31	Silty CLAY; dark grey *(continued)*													31		
	-28	32														32		
	-29	33														33		
		33.3				MW-HW	33.3	M-H				33.3-33.45m: fragmented						
		33.45	CST SST; pale brown grey				33.45											
			CORE LOSS															
	-30	34														34		
	-31	35	33.45-35.92m: possible pebbly sandstone/conglomerate						13	5						35		
		35.92					35.92											
	-32	36	SILTSTONE; grey			HW		VL-L								36		
							36.15	L	100	0		36.15-36.23m: fragmented						
							36.52					36.62-36.7m: DB						
						FR		M										
	-33	37					37.16	L				37.16-37.22m: fragmented				37		
							37.22											
							37.41					37.41-37.51m: PT SH PL, SM						
												37.63-37.69m: fragmented						
									100	51		37.94-37.97m: fragmented						
	-34	38				SW		M								38		
												38.64m: J 45° PL, SM						
							38.8					38.8-38.84m: fragmented						
	-35	39										39.0-39.37m: J SV PL, RO, <1mm, trace calcite				39		
						FR						39.2-39.32m: PT x6 SH PL, RO						
									100	71								
							39.8	M				39.8-39.82m: fragmented						

NOTES: (#)Soil origin is "probable" unless otherwise stated.

EXPORTED 03/08/22 10:14. TEMPLATE ID: DP_102.02.00_ROCKLOG

PLANT: Hanjin 114
OPERATOR: Total Drilling
LOGGED: Millard

METHOD: SFA to 2.5m, then PD to 33.3m, then HQ core to 62.0m
CASING: PQ to 2.5m, HWT to 36.2m

REMARKS: Soil description and depths are based on drillers logs. Information on soil should be obtained fron nearby Cone Penetration Tests (CPT)

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4 AHD
COORDINATE E:383791 **N:** 6355598
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 4
PROJECT No: 213618.01
DATE: 06/07/22
SHEET: 5 of 7

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	SOIL STRENGTH (where encountered) / SOIL MOISTURE	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
1.5	-37	41	SILTSTONE; grey *(continued)*			DW		M	100	71		41.6-41.64m: J x3 60° PL, SM 41.84-41.85m: fragmented				41		
	-38	42	42.36-42.45m: lenticular bedding 42.36-42.68m: pale grey				42.36									42		
	-39	43				FR			100	92						43		
	-40	44														44		
	-41	45														45		
	-42	46					46.15	H				46.09-46.12m: fragmented 46.15m: J 60° PL, FE				46		
	-43	47				FS	47.09		100	89		47.09m: J 20° IR, RO, FE				47		
	-44	48				FR										48		
	-45	49							100	79						49		

20% water loss from 46.5m to 55.58m depth

NOTES: (#)Soil origin is "probable" unless otherwise stated.

PLANT: Hanjin 114
OPERATOR: Total Drilling
LOGGED: Millard

METHOD: SFA to 2.5m, then PD to 33.3m, then HQ core to 62.0m
CASING: PQ to 2.5m, HWT to 36.2m

REMARKS: Soil description and depths are based on drillers logs. Information on soil should be obtained fron nearby Cone Penetration Tests (CPT)

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4 AHD
COORDINATE **E:**383791 **N:** 6355598
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 4
PROJECT No: 213618.01
DATE: 06/07/22
SHEET: 6 of 7

CONDITIONS ENCOUNTERED															SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	SOIL STRENGTH (where encountered) / SOIL MOISTURE	GRAPHIC	WEATH. (RS, XW, HW, MW, SW, FS, FR; DW)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.01, 0.05, 0.10, 0.50, 1.00, 5.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
1.5			SILTSTONE; grey *(continued)*			FR		H	100	79		50.34-50.56m: J 60°-70° UN, RO 50.71-50.77m: clay seam **46.5-55.58: 20% water loss**						
	-47	51														51		
	-48	52							100	72		52.4-52.74m: J 80° PL, SM 52.74-52.89m: fragmented				52		
	-49	53				FS	52.89 53.16		100	69		52.89-53.16m: J SV IR, SM, FE 53.38-53.52m: J 80° PL, SM 53.62-53.68m: J 80° PL, SM				53		
	-50	54				FR										54		
	-51	55				FS	54.92 55.22		100	54		54.92-55.22m: J SV IR, SM, FE				55		
		55.58	COAL; black; (borehole seam)				55.58	L				55.43-55.58m: fragmented						
	-52	56				FR	56.16 56.47 56.75 57.13	M L M L	100	47		55.58-56.16m: fragmented 56.47-56.75m: fragmented 59.75-54.92m: J SV PL, SM 57.13-57.55m: fragmented				56		
	-53	57														57		
		57.55	CORE LOSS; (weak coal - possible crush zone)				57.55					**55.58-60.25: intermittent water loss, 50-100% loss**						
	-54	58							52	0						58		
		58.15	COAL; black				58.15	L				58.15-58.39m: fragmented						
							58.39 58.65 58.85 59.0 59.25	M L M L				58.65-58.85m: fragmented 59.0-59.25m: fragmented						
	-55	59				FR			100	81		59.4-59.9m: J/2 SV PL, RO				59		
▶ intermittent water loss 50-100% los from 55.58m to 60.25m depth								M										

NOTES: (#)Soil origin is "probable" unless otherwise stated.

EXPORTED 03/08/22 10:14. TEMPLATE ID: DP_102.02.00_ROCKLOG

PLANT: Hanjin 114
OPERATOR: Total Drilling
LOGGED: Millard

METHOD: SFA to 2.5m, then PD to 33.3m, then HQ core to 62.0m
CASING: PQ to 2.5m, HWT to 36.2m

REMARKS: Soil description and depths are based on drillers logs. Information on soil should be obtained fron nearby Cone Penetration Tests (CPT)

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: 160-200 Parkway Avenue, Hamilton South

SURFACE LEVEL: 4 AHD
COORDINATE **E:**383791 **N:** 6355598
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 4
PROJECT No: 213618.01
DATE: 06/07/22
SHEET: 7 of 7

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA (SOIL STRENGTH (where encountered), SOIL MOISTURE)	GRAPHIC	WEATH. (RS, XW, HW, MW, SW, FS, FR, DW)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.01, 0.05, 0.10, 0.50, 1.00, 5.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
1.5	60.25		COAL; black *(continued)*			60.0	L				60.0-60.25m: fragmented						
			SILTSTONE; grey			60.25	L				60.25-60.55m: J SV PL, SM						
	60.63		SANDSTONE; pale grey; fine to medium			60.63					60.55-60.58m: fragmented						
	-57 61				FR		H	100	81						61		
	-58 62.0		Borehole discontinued at 62.00m depth			62.0									62		
	-59 63														63		
	-60 64														64		
	-61 65														65		
	-62 66														66		
	-63 67														67		
	-64 68														68		
	-65 69														69		

NOTES: (#)Soil origin is "probable" unless otherwise stated.

PLANT: Hanjin 114
OPERATOR: Total Drilling
LOGGED: Millard

METHOD: SFA to 2.5m, then PD to 33.3m, then HQ core to 62.0m
CASING: PQ to 2.5m, HWT to 36.2m

REMARKS: Soil description and depths are based on drillers logs. Information on soil should be obtained fron nearby Cone Penetration Tests (CPT)

EXPORTED 03/08/22 10:14. TEMPLATE ID: DP_102.02.00_ROCKLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.1 AHD
COORDINATE E:384063.3 **N:** 6355617.1
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 201A
PROJECT No: 213618.02
DATE: 30/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, with gravels; grey brown grey; sand fraction fine to medium; gravels fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace rootlets, glass, tape, ceramic, plastic, slag, coal		FILL	NA	D		D E		0.0		
										0.05	PID	<1
								D E		0.25	PID	<1
		0.4m: brown						D E		0.5	PID	<1
	0.6	FILL/ (SP) SAND, trace gravel; intermixed brown grey pale grey; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded; trace coal, shells, slag		FILL		M						
		0.9m: fine to coarse sub-angular to sub-rounded gravels						D E		1.0	PID	<1
	1.1	Test pit discontinued at 1.10m depth Hand refusal on gravels										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel to 0.3m Hand auger to 1.1m
METHOD:
REMARKS: D1/30.11.22 at 0.5m

OPERATOR: Kramer
LOGGED: Kramer

EXPORTED 18/01/23 15:37. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.3 AHD
COORDINATE **E:**383968.0 **N:** 6355688.9
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 202A
PROJECT No: 213618.02
DATE: 30/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	2 / 0.0	FILL/ (SP) SAND; brown; fine to medium; trace rootlets, fine sub-angular to sub-rounded gravels (crushed natural rock)		FILL		D		D E		0.0 0.05	PID	<1
	0.2	FILL/ (SP) Silty SAND; dark grey; fine to medium; trace glass, ceramic, coal, brick fragments, slag		FILL	NA	M		D E		0.25	PID	<1
								D E		0.5	PID	<1
	0.7	FILL/ (SP) SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded		FILL		M		D E		0.72	PID	<1
	0.75	Test pit discontinued at 0.75m depth Hand refusal on gravels										
	1 / 1									1		
	0 / 2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel to 0.3m Hand auger to 0.75m
METHOD:
REMARKS:

OPERATOR: Kramer
LOGGED: Kramer

EXPORTED 18/01/23 15:37. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.1 AHD
COORDINATE E:383922.4 **N:** 6355610.1
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 203A
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	2 / 0.0	FILL/ (SP) Silty SAND; brown; fine to medium; trace roots / rootlets, plastic		FILL		D to M		D, E		0.0 / 0.05	PID	<1
	0.2	FILL/ (SP) Gravelly SAND; brown pale brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to subrounded (crushed natural rock)		FILL		D		D, E		0.25	PID	<1
	0.3	(SP) SAND; pale grey; fine to medium		ALV	NA	D to M		D, E		0.5	PID	<1
	0.8	Borehole discontinued at 0.80m depth Limit of investigation										
	1 / 1									1		
	0 / 2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer
CASING:

LOGGED: Kramer

EXPORTED 18/01/23 15:37. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.0 AHD
COORDINATE E:383944.9 **N:** 6355699.7
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 204
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND; brown grey; fine to medium; trace fine to medium grained, subangular to subrounded gravel (crushed natural rock), glass, dry		FILL	NA	D to M		D E		0.05	PID	<1
		0.4m: fine to medium subangular to subrounded gravels (crushed natural rock)						D E		0.25	PID	<1
	0.7	FILL/ (SP) Silty SAND; dark brown; fine to medium; trace fine to medium subangular to subrounded gravels (crushed natural rock), ceramic, slag, coal reject, brick fragments, dry		FILL				D E		0.5	PID	<1
	0.95	Borehole discontinued at 0.95m depth Hand refusal on cobbles						D E		0.8	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 0.95m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:37. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.2 AHD
COORDINATE E:383930.1 **N:** 6355710.6
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 205
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND; brown; fine to medium; with silt, trace fine to medium subangular to subrounded gravels (crushed natural rock), glass, slag, ash, brick fragments, dry						D E		0.05	PID	<1
		0.3m: fine to medium subangular to subrounded gravels (crushed natural rock)		FILL	NA	D to M		D E		0.25	PID	<1
	0.6	Borehole discontinued at 0.60m depth Hand refusal on gravels						D E		0.5	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 0.6m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:37. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.6 AHD
COORDINATE E:383907.7 **N:** 6355729.6
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 206
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND; grey brown; fine to medium; trace fine to medium subangular to subrounded gravels (crushed natural rock), ash, rootlets, dry		FILL				D, E		0.05	PID	<1
	0.3	(SP) SAND; grey; fine to medium; trace rootlets, dry		ALV	NA	D		D, E		0.5	PID	<1
	0.65	(SP) Silty SAND; brown to dark brown; fine to medium; dry (possible indurated sand)		ALV				D, E		0.7	PID	<1
	0.95	(SP) SAND; pale brown; fine to medium; dry		ALV				D, E		1.0	PID	<1
	1.0	Borehole discontinued at 1.00m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 1.0m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:37. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.6 AHD
COORDINATE **E:**383907.4 **N:** 6355729.8
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 206A
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND, trace gravel; grey brown; sand fraction fine to medium; gravel fraction fine to medium; ash, rootlets, dry to moist		FILL	NA	D to M		D E		0.0 0.05	PID	<1
	0.4	(SP) SAND; grey; fine to medium; trace rootlets		ALV		D		D E		0.5	PID	<1
	0.7	(SP) SAND; brown; fine to medium		ALV		D		D E		0.7	PID	<1
	0.9	Test pit discontinued at 0.90m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.4 AHD
COORDINATE E:383855.8 **N:** 6355704.8
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 207
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND; brown to grey; fine to medium; trace fine to coarse subangular to subrounded gravels (crushed natural rock), rootlets, coal reject, roots, dry		FILL	NA	D		D E		0.05	PID	<1
								D E		0.25	PID	<1
								D E		0.5	PID	<1
	1.05	(SP) SAND; brown; fine to medium; dry		ALV				D E		1.0	PID	<1
								D E		1.3	PID	<1
	1.45	Borehole discontinued at 1.45m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 1.45m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.7 AHD
COORDINATE E:383885.2 **N:** 6355697.1
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 208
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND; brown; fine to medium; with silt, trace fine to medium subangular to subrounded gravels (crushed natural rock), plastic, ash, dry		FILL	NA	D		D E		0.05	PID	<1
	0.25	(SP) SAND; pale grey; fine to medium; dry to moist		ALV	NA	M		D E		0.2	PID	<1
	0.75	Borehole discontinued at 0.75m depth Limit of investigation						D E		0.5	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 0.75m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.0 AHD
COORDINATE **E:**383812.0 **N:** 6355647.1
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 209
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND; grey; fine to medium; with fine to coarse subangular to subrounded gravel (crushed natural rock), trace glass, sandstone cobbles, coal reject, dry		FILL				D E		0.05	PID	<1
		0.2-0.3m: fibro fragment observed				M		D E		0.25	PID	<1
	0.3	FILL/ (SP) Gravelly SAND, with gravel; grey brown; sand fraction fine to medium; gravel fraction fine to medium, subangular to subrounded; crushed natural rock, dry		FILL				D E		0.35	PID	<1
	0.4			FILL				D E		0.45	PID	<1
	0.5	FILL/ (SP) SAND; brown; fine to medium; trace fine to medium subangular to subrounded gravels (crushed natural rock), dry			NA							
		(SP) SAND; pale grey; fine to medium; dry to moist		ALV				D E		0.7	PID	<1
	0.85	(SP) SAND; dark brown; fine to medium; dry to moist (indurated sand)		ALV								
	3 1.0	Borehole discontinued at 1.00m depth Limit of investigation						D E		1.0	PID	<1
	2 2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 1.0m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING:

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.0 AHD
COORDINATE E:383810.8 **N:** 6355648.0
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 209A
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	4	0.0	FILL/ (SP) SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace rootlets, ash		FILL	NA	D		D E B D E		0.0 0.05 0.25 0.35	PID PID PID	<1 <1 <1
		0.35	FILL/ (SP) Gravelly SAND; brown pale brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL		D		D E		0.4	PID	<1
		0.45	(SP) SAND; pale grey; fine to medium		ALV		D to M						
		0.65	Test pit discontinued at 0.65m depth Limit of investigation										
	3	1									1		
	2	2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel
METHOD:
REMARKS:

OPERATOR:

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.1 AHD
COORDINATE **E:**383813.1 **N:** 6355646.8
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 209B
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	4 / 0.0	FILL/ (SP) SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, brick, plastic		FILL		D		D E B		0.0 0.05	PID	<1
	0.25	FILL/ (SP) SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace brick, slag		FILL	NA	D		D E B D E		0.2 0.25 0.5	PID PID PID	<1 <1 <1
	0.6	(SP) SAND; pale grey; fine to medium; trace rootlets		ALV		D				0.6	PID	<1
	0.7	Test pit discontinued at 0.70m depth Limit of investigation										
	3 / 1									1		
	2 / 2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel
METHOD:
REMARKS: D1/20.12.22 @ 0.2m

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.9 AHD
COORDINATE **E:**383810.1 **N:** 6355646.7
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 209C
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
No free groundwater observed		0.0	FILL/ (SP) SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets		FILL		D		D, E		0.0		
		0.1									0.05	PID	<1
					FILL		D		B				
		0.25	FILL/ (SP) SAND, with silt; brown; fine to medium; trace metal, glass, plastic, fine to medium sub-angular to sub-rounded gravels (crushed natural rock)						D, E		0.2	PID	<1
											0.25	PID	<1
			FILL/ (SP) SAND, trace gravel; brown dark brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL	NA	D		D, E		0.5	PID	<1
		0.65	(SP) SAND; pale grey; fine to medium		ALV		D to M		D		0.7	PID	<1
		0.8	(SP) SAND; dark brown; fine to medium		ALV		D to M						
		0.85	Test pit discontinued at 0.85m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.0 AHD
COORDINATE **E:**383809.5 **N:** 6355649.2
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 209D
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown grey; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); rootlets		FILL	NA	D to M		D E B D E		0.0 0.05 0.25 0.3	PID PID PID	<1 <1 <1
	0.3	(SP) SAND; brown; fine to medium; trace rootlets 0.5m: pale grey		ALV		D		D E		0.5	PID	<1
	0.6	Test pit discontinued at 0.60m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.9 AHD
COORDINATE **E:**383812.4 **N:** 6355649.9
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 209E
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown grey; sand fraction fine to medium; gravel fraction fine to coarse sub-angular, sub-rounded, angular (crushed natural rock); rootlets, asphalt, brick fragments		FILL		D		D E		0.0 0.05	PID	<1
	0.25	FILL/ (SP) SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace slag and ash		FILL	NA	M		D E B		0.2	PID	<1
	0.55	(SP) SAND; pale brown; fine to medium		ALV		D		D E		0.5	PID	<1
	0.75	Test pit discontinued at 0.75m depth Limit of investigation						D		0.7	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.0 AHD
COORDINATE E:383909.5 **N:** 6355620.0
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 210
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (GP) Sandy GRAVEL; fine, sub-angular to sub-rounded; with fine to medium grained sand, dry (crusher dust)		FILL				D, E		0.05	PID	<1
	0.07	0.07m: black hessian dividing layer										
		FILL/ (SP) Silty SAND; brown grey; fine to medium; trace fine to medium subangular to subrounded gravels (crushed natural rock), ash, dry		FILL				D, E		0.25	PID	<1
	0.3	(SP) SAND; grey; fine to medium; trace rootlets, dry			NA	D						
		0.5m: pale grey, dry to moist		ALV				D, E		0.5	PID	<1
	0.75	Borehole discontinued at 0.75m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 0.75m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.7 AHD
COORDINATE E:383929.6 **N:** 6355659.2
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 211
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND; brown grey; fine to medium; with silt, trace slag, ash, brick fragments, fine to medium subangular to subrounded gravels (crushed natural rock), sandstone cobble, dry		FILL				D E		0.05	PID	<1
								D E		0.25	PID	<1
	0.4	(SP) SAND; grey; fine to medium; trace rootlets, dry			NA	D		D E		0.5	PID	<1
		0.6m: pale grey		ALV								
	0.9	Borehole discontinued at 0.90m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 0.9m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 8.2 AHD
COORDINATE E:383936.9 **N:** 6355670.8
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 212
PROJECT No: 213618.02
DATE: 11/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	8.2 / 0.0	FILL/ (SP) SAND; brown; fine to medium; with fine to coarse subangular to subrounded gravel (crushed natural rock), trace plastic, rootlets, cobbles, roots, dry		FILL	NA	D		D E		0.05	PID	<1
								D E		0.25	PID	<1
								D E		0.5	PID	<1
	7.6 / 0.6	Borehole discontinued at 0.60m depth Limit of investigation										
	8 / 1									1		
	7 / 1											
	6 / 2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand Auger to 0.6m
REMARKS: Co-ordinates by hand held GPS. Approximate surface level based on interpolation from survey plan

OPERATOR: Kramer
CASING: Uncased

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.7 AHD
COORDINATE E:383864.8 **N:** 6355643.5
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 213
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND, with silt, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL		D		D, E		0.0		
	0.1	FILL/ (SP) Gravelly SAND, with silt; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace brick		FILL	NA	D		D, E		0.05	PID	<1
								D, E		0.25	PID	<1
	0.6	Borehole discontinued at 0.60m depth Hand refusal						D, E		0.5	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer
CASING:

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.0 AHD
COORDINATE **E:**383863.7 **N:** 6355620.9
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 214
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed		0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); abundant rootlets		FILL	NA	D		D E		0.0 0.05	PID	<1
		0.1	0.1m: possible pavement Borehole discontinued at 0.10m depth Hand refusal										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS: Bore through garden bed

OPERATOR: Kramer
CASING:

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.9 AHD
COORDINATE E:383864.6 **N:** 6355623.4
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 214A
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium, sub-angular to sub-rounded (crushed natural rock); abundant rootlets		FILL		M		D E		0.0 0.05	PID	<1
	0.1	Test pit discontinued at 0.10m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

Refer to explanatory notes for symbol and abbreviation definitions

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.0 AHD
COORDINATE **E:**383866.0 **N:** 6355621.3
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 214B
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	4 / 0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium, sub-angular to sub-rounded (crushed natural rock); abundant rootlets		FILL		M		D E		0.0 0.05	PID	<1
	0.1	Test pit discontinued at 0.10m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.3 AHD
COORDINATE E:383989.8 **N:** 6355656.7
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 215
PROJECT No: 213618.02
DATE: 30/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, with gravel; brown grey; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, asphalt, glass, ceramic, metal		FILL		D		D E		0.0 0.05	PID	<1
	0.55	FILL/ (SP) SAND, trace gravel; pale grey pale brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL	NA	D		D E		0.25	PID	<1
	0.8	FILL/ (SP) SAND, with silt; intermixed brown pale brown orange; fine to medium		FILL		M		D E		0.5	PID	<1
		1.1m: with fine to coarse sub-angular to sub-rounded gravels						D E		0.7	PID	<1
		1.2m: wet						D E		1.0	PID	<1
	1.3	Test pit discontinued at 1.30m depth Hand refusal on gravels										

NOTES: [#]Soil origin is "probable" unless otherwise stated. [*]Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel to 0.3m Hand auger to 1.3m
METHOD:
REMARKS:

OPERATOR: Kramer
LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL:
COORDINATE E: N:
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 216
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium subangular to subrounded (crushed natural rock); (crushed natural rock), dry to moist		FILL				D E		0.0 0.05	PID	<1
	0.1	Test pit discontinued at 0.10m depth Limit of investigation										
	1									1		
	2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kennedy

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL:
COORDINATE E: N:
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 216A
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium, sub-angular to sub-rounded (crushed natural rock)		FILL		D to M		D E		0.0 0.05	PID	<1
	0.1	Test pit discontinued at 0.10m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL:
COORDINATE E: N:
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 217
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium subangular to subrounded; (crushed natural rock), dry to moist		FILL	NA	D to M		D E		0.0 0.05	PID	<1
	0.1	Test pit discontinued at 0.10m depth Limit of investigation										
	1									1		
	2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kennedy

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL:
COORDINATE E: N:
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 217A
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium, sub-angular to sub-rounded (crushed natural rock)		FILL		D to M		D E		0.0 0.05	PID	<1
	0.1	Test pit discontinued at 0.10m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

Refer to explanatory notes for symbol and abbreviation definitions

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL:
COORDINATE E: N:
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 218
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium subangular to subrounded; (crushed natural rock), dry to moist		FILL	NA	D to M		D E		0.0 0.05	PID	<1
	0.15	Test pit discontinued at 0.15m depth Limit of investigation										
	1									1		
	2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kennedy

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL:
COORDINATE E: N:
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 219
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium, sub-angular to sub-rounded (crushed natural rock)		FILL		D to M		D E		0.0		
No free groundwater observed	0.05	Test pit discontinued at 0.05m depth Limit of investigation								0.05	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL:
COORDINATE E: N:
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 220
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium, sub-angular to sub-rounded (crushed natural rock)		FILL		D to M		D E		0.0		
No free groundwater	0.05	Test pit discontinued at 0.05m depth Limit of investigation								0.05	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD:
REMARKS:

OPERATOR: Kramer

LOGGED: Kramer

EXPORTED 18/01/23 15:38. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.0 AHD
COORDINATE E:383938.6 **N:** 6355703.5
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 221
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	3 / 0.0	FILL/ (SP) Silty SAND; brown; fine to medium; with rootlets		FILL		M		D		0.0		
	0.06							E		0.05	PID	<1
	0.11	FILL/ (GP) Sandy GRAVEL, with silt, with slag; brown; medium to coarse, angular to sub-angular, (crushed natural rock); trace brick fragments, glass shards, ceramic shards		FILL		M		D		0.1	PID	<1
		FILL/ (SP) Silty SAND, with gravel; brown dark brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace coal reject, slag (possibly coal tar asphalt), brick fragments		FILL	NA	M		D		0.3	PID	<1
								E				
										0.5	PID	<1
							coal tar sample	D		0.6	PID	<1
								E				
										0.7	PID	<1
	0.75	Test pit discontinued at 0.75m depth Refusal on brick										
	2 / 1									1		
	1 / 2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Auger
METHOD:
REMARKS:

OPERATOR: Kramer/Helbig

LOGGED: Kramer

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TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.8 AHD
COORDINATE E:383951.7 **N:** 6355696.3
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 222
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); with rootlets		FILL		M		D E		0.0 0.1	PID	<1
	0.3	FILL/ (SP) SAND, with silt, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular (crushed natural rock); trace slag, concrete pieces, brick (half bricks and fragments), possible coal tar asphalt fragments		FILL	NA	M		D E		0.4	PID	<1
	0.9	(SP) SAND; brown pale brown; fine to medium		ALV		M		D E		0.8	PID	<1
	1.1	Test pit discontinued at 1.10m depth Limit of investigation						D		1.0	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel to 0.5m then hand auger to 1.1m
METHOD:
REMARKS:

OPERATOR: Kramer/Helbig

LOGGED: Kramer

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TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 1.1 AHD
COORDINATE **E:**384002.6 **N:** 6355660.0
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 223
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	1.1 / 0.0	FILL/ (SP) Silty SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets		FILL		M		D E		0.0 0.05	PID	<1
	1.0 / 0.1			FILL		M		D E		0.15	PID	<1
	0.9 / 0.2	FILL/ (SP) SAND; brown; fine to medium; trace rootlets								0.2	PID	<1
		FILL/ (SP) Silty SAND; brown to dark brown; fine to medium; trace glass shards, brick fragments, ceramic shards, ash, slag, bolts, copper coil, plastic (hard)		FILL	NA	M		D E B		0.3	PID	<1
							D2/LAH	D E		0.5	PID	<1
	0.5 / 0.6	Test pit discontinued at 0.60m depth Limit of investigation								0.6	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel to 0.6m
METHOD:
REMARKS:

OPERATOR: Kramer/Helbig

LOGGED: Kramer

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 1.8 AHD
COORDINATE **E:**384022.4 **N:** 6355645.2
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 224
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND; brown; fine to medium; trace rootlets, ceramic shards, slag, metal shards, glass shards, coal reject		FILL	NA	M		D, E		0.0 / 0.05	PID	<1
								B				
								D, E		0.5	PID	<1
	0.65	FILL/ (SP) SAND; pale brown; fine to medium; trace rootlets		FILL		M				0.7	PID	<1
								D, E		0.8	PID	<1
	1.0	FILL/ (SP) SAND, with clay, with gravel; dark brown dark grey; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL		M				1		
		1.1m: From 1.1m, trace ceramic and ash				W		D, E		1.1	PID	<1
	1.2	Test pit discontinued at 1.20m depth Limit of investigation								2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Shovel to 0.65m then hand auger to 1.2m
METHOD:
REMARKS:

OPERATOR: Kramer/Helbig

LOGGED: Kramer

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.9 AHD
COORDINATE E:384047.2 **N:** 6355627.6
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 225
PROJECT No: 213618.02
DATE: 20/12/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.0	FILL/ (SP) Silty SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace rootlets, slag, ash, ceramic shards, glass shards		FILL		M		D E		0.0 0.05	PID	<1
								B				
								D E		0.5	PID	<1
	0.6	FILL/ (SP) SAND; pale brown; fine to medium; trace rootlets, ash, ceramic shards			NA					0.6	PID	<1
				FILL		M		D E		0.8	PID	<1
Free groundwater observed ∇	1.0	FILL/ (SP) SAND, with clay, trace gravel; dark brown dark grey; sand fraction fine to medium; gravel fraction fine to medium sub-rounded (crushed natural rock); pockets of red brown low plasticity sandy clay		FILL		M W	D3/LAH	D E		1.05	PID	<1
	1.2	1.1m: trace glass Test pit discontinued at 1.20m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
OPERATOR: Kramer/Helbig
LOGGED: Kramer
METHOD: Shovel to 0.6m then hand auger to 1.2m
REMARKS:

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.1 AHD
COORDINATE E:384041.4 **N:** 6355631.2
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 301
PROJECT No: 213618.02
DATE: 04/10/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (ML) SILT, trace sand; brown; silt fraction low plasticity; sand fraction fine to medium; trace rootlets, glass, slag, ash, ceramic, fine to coarse sub-angular to sub-rounded gravel		FILL	NA	W to <PL		D, E		0.05	PID	<1
								D, E		0.3	PID	<1
								D, E		0.5	PID	<1
	0.6	FILL/ (SP) SAND, with silt, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium, sub-angular to sub-rounded; trace ceramic		FILL	NA	M		D, E		0.7	PID	<1
	0.8	(SP) SAND; pale brown; fine to medium		ALV		W		D, E		1.0	PID	<1
	1.3	Borehole discontinued at 1.30m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 300mm Auger
METHOD: 300mm auger to 1.3m
REMARKS:

OPERATOR: Kramer
CASING:

LOGGED: Kramer

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.1 AHD
COORDINATE **E:**384012.6 **N:** 6355654.8
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 302
PROJECT No: 213618.02
DATE: 04/10/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwateer observed	2	0.0	FILL/ (ML) SILT, trace sand; brown; silt fraction low plasticity; sand fraction fine to medium grain; trace rootlets, glass, slag, ash, ceramic, fine to coarse sub-angular to sub-rounded gravel		FILL		W to <PL		D, E		0.05	PID	<1
									D, E		0.3	PID	<1
		0.4	FILL/ (SP) Silty SAND; brown; fine to medium; with fine to medium sub-angular to sub-rounded gravels (Cnr), slag gravels, trace ceramic, coal reject, and rootlets		FILL		D to M		D, E		0.5	PID	<1
		0.8	FILL/ (SP) SAND, with silt; grey; fine to medium; fine to medium sub-angular to sub-rounded gravels, trace ceramic, metal, wire and organics		FILL		M		D, E		1.0	PID	<1
	1	1.1	FILL/ (CL) Silty CLAY, with sand; grey; clay fraction low plasticity; sand fraction fine to medium grain; trace brick, rootlets		FILL	NA	W to <PL		D, E		1.15	PID	<1
		1.2	FILL/ (SP) Silty SAND; grey, dark grey; fine to medium; with fine to medium ash gravels, fine to medium sub-angular to sub-rounded gravels (crushed natural rock), trace organics and coal rejects		FILL		M to W		D, E		1.3	PID	<1
		1.4	FILL/ (SP) SAND; grey; fine to medium; trace fine to medium sub-angular to sub-rounded gravels (crushed natural rock)		FILL		W		D, E		1.5	PID	<1
		1.6	FILL/ (ML) SILT; grey brown; low plasticity; trace rootlets		FILL		W to <PL		D		1.65	PID	<1
		1.7	FILL/ (SP) SAND, with silt; grey; fine to medium; organics, fine to medium sub-angular to sub-rounded gravels (crushed natural rock)), brick, rubber		FILL		W		D, E		1.8	PID	<1
	0	1.9	FILL/ (ML) Clayey SILT, trace gravel; grey; silt fraction low plasticity; gravel fraction fine to medium, sub-angular to sub-rounded; with organics		FILL		W to <PL		D, E		2.0	PID	<1
		2	2.0m: several bones up to 100mm length										
		2.1	Borehole discontinued at 2.10m depth Limit of machine										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 300mm Auger
METHOD: 300mm auger to 2.1m
REMARKS:

OPERATOR: Kramer
CASING:

LOGGED: Kramer

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.5 AHD
COORDINATE E:383964.9 **N:** 6355622.3
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 303
PROJECT No: 213618.02
DATE: 04/10/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND; brown; fine to medium; trace rootlets, bricks, fine to medium sub-angular to sub-rounded gravels (crushed natural rock)		FILL		M		D, E		0.05	PID	<1
								D, E		0.3	PID	<1
	0.5	FILL(?)/ (SP) SAND, with silt; grey; fine to medium; trace rootlets		possibly FILL		M to W		D, E		0.5	PID	<1
								D, E		0.6		
	0.65	FILL(?)/ (CH) CLAY; pale brown mottled grey; high plasticity; trace rootlets, fine rounded gravels (crushed natural rock)		possibly FILL	NA	W to <PL		D, E		1.0	PID	<1
	1.1	(SP) SAND, with silt; grey; fine to medium; trace rootlets		ALV		M		D, E		1.2	PID	<1
	1.3	(SP) SAND; pale grey; fine to medium		ALV		M		D, E		1.5	PID	<1
	1.7	Borehole discontinued at 1.70m depth Limit of investigation								2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 300mm Auger
METHOD: 300mm auger to 1.7m
REMARKS:

OPERATOR: Kramer
CASING:

LOGGED: Kramer

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.4 AHD
COORDINATE E:384044.3 **N:** 6355587.7
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 304
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND; brown; fine to medium; trace rootlets, roots, ceramic, glass		FILL		D		D E		0.0 0.05	PID	<1
	0.3	FILL/ (CH) CLAY; grey mottled brown; high plasticity; trace rootlets, fine to medium sub-angular to sub-rounded gravels (crushed natural rock)		FILL		W <PL		D E		0.25 0.4	PID PID	<1 <1
	0.5	(SP) SAND, with silt; grey; fine to medium 0.85m: pale grey		ALV	NA	M		D E		0.7	PID	<1
	1.0	Test pit discontinued at 1.00m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 1.0m
REMARKS:

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.3 AHD
COORDINATE **E:**384023.0 **N:** 6355612.5
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 305
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Seepage at 1.2m, free groundwater observed at 2.8m	0.0 / 2	FILL/ (SP) Silty SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, roots		FILL		D		D E		0.0 0.05	PID	<1
	0.25	FILL/ (SP) Silty Gravelly SAND; dark grey brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, fine to coarse slag gravels, ceramic, glass, ash		FILL		M		D E		0.3	PID	<1
	0.5			FILL		M		D E		0.6	PID	<1
	0.65	FILL/ (SP) Silty SAND; brown; fine to medium; trace brick, glass, metal, ceramic 0.6m: fibro fragment observed (305F)										
	1	FILL/ SAND; fine to medium		FILL				D E		1.0	PID	<1
	1.2 / 1	FILL/ SAND; intermixed pale brown grey; fine to medium; trace metal sheets / rods, trace glass, plastic		FILL	NA	W		D E		1.5	PID	<1
	1.8	FILL/ SILT; dark grey; low plasticity; with organics		FILL		W >PL		D E		2.0	PID	<1
	2.1 / 0	FILL/ (SP) Silty SAND; grey; fine to medium		FILL		M to W		D E		2.5	PID	<1
	3							D E		3.0	PID	<1
	3.15 / -1	Test pit discontinued at 3.15m depth Limit of machine										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 3.15m
REMARKS: D1/28.11.22

OPERATOR: Kramer/Krebs

LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.3 AHD
COORDINATE E:384000.5 **N:** 6355629.8
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 306
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.0	FILL/ (SP) Silty SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, roots, ceramic		FILL		D		D E		0.0 0.05	PID	<1
	2	0.3	FILL/ (SP) Silty Gravelly SAND; dark grey brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, fine to coarse slag gravels, ceramic, glass, ash		FILL		M		D E		0.4	PID	<1
		0.5	SAND; pale brown; fine to medium				M		D E		0.6	PID	<1
		0.7	SAND, trace gravel; intermixed pale brown grey; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); with rusted metal, trace glass, sandstone cobbles				M						
		1							D E		1.0	PID	<1
	1	1.1	FILL/ Clayey SAND; dark grey; trace metal / gravels, fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL	NA	M		D E		1.2	PID	<1
		1.3	FILL/ Sandy Clayey GRAVEL; dark grey; gravel fraction fine to medium, sub-angular to sub-rounded, (crushed natural rock); sand fraction fine to medium		FILL		W		D E		1.4	PID	<1
		1.5	FILL/ Clayey SAND; grey; fine to medium; trace rootlets		FILL		W		D E		1.6	PID	<1
		2							D E		2.0	PID	<1
	0	2.1	FILL/ (CL) Silty CLAY; dark grey; low plasticity; trace rootlets		FILL		W >PL		D E		2.2	PID	<1
		2.3	Test pit discontinued at 2.30m depth Pit collapse										

Free groundwater observed ⊻

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 2.3m
REMARKS:

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

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TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 2.5 AHD
COORDINATE E:383985.5 **N:** 6355642.7
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 307
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.0	FILL/ (SP) Silty SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, gravel		FILL		D		D E		0.0 0.05	PID	<1
		0.25	FILL/ Silty SAND, with gravel; grey brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace glass, brick, terracotta, slag, ceramic, coal 0.3-0.5m: abundant fibro fragments (307F) present		FILL				D E		0.3	PID	<1
	2								D E		0.5	PID	<1
		0.7	FILL/ (SP) SAND; pale brown; fine to medium 0.8m: pale brown grey		FILL		D to M		D E		0.8	PID	<1
		0.9	FILL/ (SP) Clayey SAND, trace gravel; intermixed brown grey; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace ceramic, brick, glass, rusted metal		FILL	NA			D E		1.0	PID	<1
	1	1.4	FILL/ SAND, with silt; grey; fine to medium; trace organics		FILL				D E		1.5	PID	<1
		1.6	FILL/ (CL) Silty CLAY; dark grey; low plasticity; trace rootlets		FILL		W >PL		D E		1.8	PID	<1
		2.0	FILL/ Clayey SAND; brown grey; fine to medium; with abundant organics 2.0-2.3m: strong decaying organic odor		FILL		W		D E		2 2.2	PID	<1
Seepage	0	2.3	(SP) SAND; grey pale grey; fine to medium		ALV		W		D E		2.5	PID	<1
		2.7	Test pit discontinued at 2.70m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 2.7m
REMARKS: D2/28.11.22 at 0.3m

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

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TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.5 AHD
COORDINATE E:383956.6 **N:** 6355601.0
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 308
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND; brown; fine to medium; trace rootlets		FILL		D		D, E		0.0 / 0.05	PID	<1
	0.2	FILL/ (GP) Sandy GRAVEL; grey; fine to medium, sub-angular to sub-rounded, (crushed natural rock); with slag, coal, ash		FILL		D		D, E		0.25	PID	<1
	0.35	(SP) SAND; pale grey; fine to medium; trace rootlets		ALV	NA	M		D, E		0.5	PID	<1
	0.7	Test pit discontinued at 0.70m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 0.7m
REMARKS:

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.4 AHD
COORDINATE E:383971.8 **N:** 6355591.2
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 309
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed		0.0	FILL/ (SP) Silty SAND; brown; fine to medium; trace rootlets		FILL		D		D E		0.0 0.05	PID	<1
		0.2	FILL/ (GP) Sandy GRAVEL; grey; fine to medium, sub-angular to sub-rounded, (crushed natural rock); with slag, coal, ash		FILL		D		D E		0.25	PID	<1
		0.3	(SP) SAND; pale grey; fine to medium; trace rootlets		ALV	NA	M		D E		0.5	PID	<1
		0.7	Test pit discontinued at 0.70m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 0.7m
REMARKS:

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.3 AHD
COORDINATE **E:**383991.5 **N:** 6355574.4
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 310
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	DEPTH (m) / RL (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0 / 3	FILL/ (SP) Silty SAND; brown; fine to medium; trace rootlets		FILL	NA	D		D E		0.0 0.05	PID	<1
	0.2	(SP) SAND; pale grey; fine to medium; trace rootlets		ALV		M		D E		0.25	PID	<1
								D E		0.5	PID	<1
	0.6 / 1	Test pit discontinued at 0.60m depth Limit of investigation								1		
	2									2		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 0.6m
REMARKS:

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.1 AHD
COORDINATE **E:**384002.8 **N:** 6355589.4
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 311
PROJECT No: 213618.02
DATE: 28/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	3 / 0.0	(SP) Silty SAND; brown; fine to medium; trace glass		ALV				D E		0.0 0.05	PID	<1
								D E		0.25	PID	<1
	0.4	(SP) SAND; pale grey; fine to medium; trace rootlets		ALV	NA	M		D E		0.5	PID	<1
	2 / 0.8	Test pit discontinued at 0.80m depth Limit of investigation										
	1									1		
	2									2		
	1											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 0.8m
REMARKS: D3/28.11.22 at 0.25m

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.8 AHD
COORDINATE E:383891.4 **N:** 6355717.2
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 312
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) Silty SAND; brown; fine to medium; trace rootlets		FILL	NA	M		D, E		0.0		
	0.05									0.05	PID	<1
		FILL/ (SP) SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace brick, terracotta, rootlets, concrete, plastic		FILL		D		D, E		0.25	PID	<1
	0.35	(SP) SAND; pale brown; fine to medium		ALV		M		D, E		0.5	PID	<1
	1.1	Test pit discontinued at 1.10m depth Limit of investigation						D, E		1.0	PID	<1

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 1.1m
REMARKS:

OPERATOR: Kramer
LOGGED: Kramer

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.9 AHD
COORDINATE **E:**383843.2 **N:** 6355654.9
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 313
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ (SP) SAND, with silt, with gravel; brown; sand fraction fine to medium; gravel fraction fine sub-angular to sub-rounded (crushed natural rock); trace plastic, roots		FILL		D		D E		0.0 0.05	PID	<1
	0.1	FILL/ (SP) SAND, trace gravel; pale brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); cobbles		FILL		D		D E		0.25	PID	<1
	0.3	FILL/ (SP) Gravelly SAND; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace rootlets, (possible pavement gravels)		FILL		M		D E		0.5	PID	<1
	0.6	FILL/ (SP) Gravelly SAND; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace brick, concrete, terracotta, cobbles, plastic, slate, metal		FILL	NA	D		D E		1.0	PID	<1
	4 1											
	1.3	ASPHALTIC CONCRETE;						D E		1.35	PID	<1
	1.37	FILL/ (SP) Gravelly SAND; pale brown; sand fraction fine to medium; gravel fraction fine to medium sub- angular to sub-rounded; (pavement gravels)		FILL		M		D E		1.5	PID	<1
	1.65	ASPHALTIC CONCRETE;						D		1.67	PID	<1
	1.7	(SP) SAND; pale brown; fine to medium		ALV		M		D E		2.0	PID	<1
	3 2											
	2.2	Test pit discontinued at 2.20m depth Limit of investigation										
	2											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 2.2m
REMARKS: D1/29.11.22 at 1.0m

OPERATOR: Kramer
LOGGED: Kramer

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 3.9 AHD
COORDINATE E:383857.4 **N:** 6355649.0
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 314
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed		0.0	FILL/ (SP) SAND, with silt; brown; fine to medium; trace rootlets		FILL		D		D E		0.0 0.05	PID	<1
		0.1	FILL/ (SP) Gravelly SAND, with silt; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace rootlets, brick		FILL				D E		0.15	PID	<1
		0.2							D E		0.23	PID	<1
		0.25	ASPHALTIC CONCRETE;										
			FILL/ (SP) Gravelly SAND; pale brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded; (pavement gravels)		FILL		M		D E		0.4	PID	<1
		0.5	FILL/ (SP) Gravelly SAND; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock); trace brick fragments		FILL	NA	M		D E		0.55	PID	<1
		0.7	(SP) SAND; pale brown; fine to medium		ALV		M						
	3								D E		1.0	PID	<1
	1	1.1	Test pit discontinued at 1.10m depth Limit of investigation										
	2	2									2		
	1												

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 1.1m
REMARKS:

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 4.9 AHD
COORDINATE E:383836.2 **N:** 6355627.1
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 315
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0	FILL/ Silty SAND; brown; fine to medium		FILL		D		D E		0.0 0.05	PID	<1
	0.1	FILL/ (SP) SAND, trace gravel; pale brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace sandstone cobbles / boulder		FILL				D E		0.25	PID	<1
								D E		0.5	PID	<1
	0.6	FILL/ (SP) SAND, with gravel; brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); trace metal, plastic, brick, asphalt, ceramic, terracotta		FILL								
	4							D E		1.0	PID	<1
	1											
	1.15	FILL/ Gravelly SAND; pale red; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL	NA	D to M		D E		1.2	PID	<1
	1.25	FILL/ SAND, with gravel; dark brown; sand fraction fine to medium; gravel fraction fine to medium (crushed natural rock); trace concrete		FILL				D E		1.5	PID	<1
	1.85	SAND; grey pale grey; fine to medium										
	3											
	2	2.1m: brown, moist				M		D E		2.0	PID	<1
	2.4	Test pit discontinued at 2.40m depth Limit of investigation										
	2											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 2.4m
REMARKS:

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

EXPORTED 18/01/23 15:39. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Newcastle High School Upgrade
LOCATION: Parkway Avenue, Hamilton South

SURFACE LEVEL: 5.1 AHD
COORDINATE **E:**383848.7 **N:** 6355618.3
DATUM/GRID: MGA94 Zone 56

LOCATION ID: 316
PROJECT No: 213618.02
DATE: 29/11/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	5 / 0.0	FILL/ Silty SAND; brown; fine to medium		FILL		D		D, E		0.0 / 0.05	PID	<1
	0.1	FILL/ (SP) SAND, trace gravel; pale brown; sand fraction fine to medium; gravel fraction fine to coarse sub-angular to sub-rounded (crushed natural rock); sandstone cobbles / boulder		FILL				D, E		0.25	PID	<1
								D, E		0.5	PID	<1
	0.75	FILL/ (SP) SAND, with silt; dark brown; fine to medium; trace concrete, brick		FILL	NA	D		D, E		1.0	PID	<1
	4 / 1											
	1.35	FILL/ Gravelly SAND; pale red; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL		D to M		D, E		1.4	PID	<1
	1.45	FILL/ (SP) SAND, trace gravel; brown; sand fraction fine to medium; gravel fraction fine to medium sub-angular to sub-rounded (crushed natural rock)		FILL		D to M		D, E		1.5	PID	<1
	1.7	(SP) SAND; pale grey; fine to medium		ALV		M						
	3 / 2							D, E		2.0	PID	<1
	2.2	Test pit discontinued at 2.20m depth Limit of investigation										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 5.5T Excavator with 450mm bucket
METHOD: 450mm bucket to 2.2m
REMARKS: D2/29.11.22

OPERATOR: Kramer/Krebs
LOGGED: Kramer/Krebs

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Appendix B

Martens (2021) Borehole Logs and Explanatory Notes
Table B1 – Summary of Laboratory Results – Acid Sulfate Soils (Martens, 2021)
Envirolab Laboratory Reports (Martens, 2021)

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH101**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7594	RL SURFACE	3 m	DATUM AHD
EXCAVATION DIMENSIONS		9.00 m depth	NORTHING	-32.9313	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L		1	3.00	1 ES 0.10 m 1 D 0.20-0.40 m			SP	FILL: Gravelly SAND; fine to medium grained; dark grey; with silt; trace clay; medium grained gravels.	M		FILL
	H		2	*2.00* 1.00 ***2.50***					Coarse grained gravels/boulders encountered.			
		19/01/21	3	0.50	1 ES 2.60 m 1 D 3.00-3.20 m			SP	SAND; find to medium grained; dark grey; with silt; trace clay and gravel; sandy clay seams encountered at irregular intervals.			ALLUVIUM
	L		4							W		
			5									
			6									
			7									
			8									
			9	*9.00*					Hole Terminated at 9.00 m (Target depth reached)			

EXCAVATION LOG TO BE READ IN CONJUCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

MARTENS & ASSOCIATES PTY LTD
Suite 201, 20 George St. Hornsby, NSW 2077 Australia
Phone: (02) 9476 9999 Fax: (02) 9476 8767
mail@martens.com.au WEB: http://www.martens.com.au

Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH102**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7581	RL SURFACE	3 m	DATUM AHD
EXCAVATION DIMENSIONS		9.00 m depth	NORTHING	-32.9306	ASPECT		SLOPE

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T				3.00 *0.20* 2.80	1 ES 0.10 m 1 B 0.20-0.60 m 1 ES 0.30 m 1 D 0.40-0.60 m			SP SP	FILL: Sandy CLAY; low to medium plasticity; dark brown; with fine to medium grained gravels. SAND; fine to medium grained; brown; trace silt; trace fine gravels.			FILL ALLUVIUM
			1	*1.00* 2.00					Becoming pale brown/grey.			
			2		1 D 2.00-2.20 m							
			3		1 D 3.00-3.20 m					M	MD - D	
	L		4									
		19/01/21	5		1 D 5.00-5.20 m							
			6									
			7	*7.00* -4.00	1 D 7.00-7.20 m				Clayey SAND; fine to medium grained; grey; with silt.	W		
	M		8									
			9	*9.00*					Hole Terminated at 9.00 m (Target depth reached)			

EXCAVATION LOG TO BE READ IN CONJUCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

MARTENS & ASSOCIATES PTY LTD
Suite 201, 20 George St. Hornsby, NSW 2077 Australia
Phone: (02) 9476 9999 Fax: (02) 9476 8767
mail@martens.com.au WEB: http://www.martens.com.au

Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH103**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7576	RL SURFACE	4 m	DATUM AHD
EXCAVATION DIMENSIONS		9.00 m depth	NORTHING	-32.9313	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	M	19/01/21	1	4.00	1 ES 0.10 m 1 B 0.20-0.60 m 1 D 0.30-0.50 m 1 ES 0.60 m			SP	FILL: SAND; fine to medium grained; brown; with medium grained gravels; with silt; trace clay.	M		FILL
				1.50								
				2.50	1 ES 1.60 m			SP	SAND; fine to medium grained; pale brown/yellow; trace clay; trace silt.			ALLUVIUM
			2	*2.00*								
				2.00	1 D 2.10-2.30 m				Becoming pale brown.			
			3									
			4		1 D 4.00-4.20 m							
	L		5									
				5.50								
				-1.50					Becoming brown/grey.			
			6		1 D 6.00-6.20 m					W		
				6.50								
				-2.50					Becoming grey; increasing clay content.			
			7		1 D 7.00-7.20 m							
				7.50								
				-3.50				SC	Clayey SAND; fine to medium grained; grey.			
			8									
				8.50								
				-4.50				CI	Sandy CLAY; medium plasticity; grey; with silt.			
					1 D 8.70-8.90 m							
			9	*9.00*					Hole Terminated at 9.00 m (Target depth reached)			

EXCAVATION LOG TO BE READ IN CONJUCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

MARTENS & ASSOCIATES PTY LTD
Suite 201, 20 George St. Hornsby, NSW 2077 Australia
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Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH104**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7588	RL SURFACE	4 m	DATUM AHD
EXCAVATION DIMENSIONS		9.00 m depth	NORTHING	-32.9317	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L	19/01/21	0	4.00	1 B 0.10-0.50 m 2 ES 0.10 m 1 D 0.30-0.50 m			SP	SAND; fine to medium grained; pale brown; with silt; trace gravel.			ALLUVIUM
				1.00 3.00								
			1		1 ES 1.10 m			SC	SAND; fine to medium grained; brown/pale brown; trace silt and gravel.			
			2		1 D 2.00-2.20 m					M	MD - D	
			3		1 D 3.00-3.20 m							
			4		1 D 4.10-4.30 m							
			5									
			6									
			7							W		
			8	*8.00* -4.00				CL-CI	Sandy CLAY; low to medium plasticity; grey.			
			9	*9.00*					Hole Terminated at 9.00 m (Target depth reached)			

EXCAVATION LOG TO BE READ IN CONJUCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH105**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7591	RL SURFACE	3 m	DATUM AHD
EXCAVATION DIMENSIONS		6.00 m depth	NORTHING	-32.9315	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L	19/01/21	0	3.00	2 ES 0.10 m			SC	FILL: Clayey SAND; fine grained; brown/dark brown; trace fine to medium grained gravels.	M		FILL
			1		1 D 0.30-0.50 m							
				1.50								
				1.50				SC	Clayey SAND; find to medium grained; brown/dark grey; trace silt, clay and gravel.		L	ALLUVIUM
			2		1 ES 1.80 m 1 D 1.90-2.10 m							
			3								MD - D	
			4							W		
					1 D 4.50-4.70 m							
				5.00								
			5	-2.00				SC	Clayey SAND; medium to coarse grained; pale brown.			
					1 D 5.50-5.70 m							
			6	*6.00*					Hole Terminated at 6.00 m (Target depth reached)			
			7									
			8									
			9									

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CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH106**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7592	RL SURFACE	4 m	DATUM AHD
EXCAVATION DIMENSIONS		6.00 m depth	NORTHING	-32.9319	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L			4.00	1 ES 0.10 m 1 D 0.20-0.40 m			SP	SAND; fine grained; grey/pale grey.			ALLUVIUM
				0.80								
			1	3.20	1 ES 0.90 m 1 D 1.00-1.20 m			SM	Silty SAND; fine grained; brown/dark brown.	M	MD	
				1.90								
		19/01/21	2	2.10	1 D 2.00-2.20 m			SP	SAND; fine to medium grained; pale brown.			
			3									
			4		1 D 4.00-4.20 m					W	MD - D	
			5									
				5.40								
				-1.40					Becoming grey/yellowish brown.			
					1 D 5.60-5.80 m							
			6	*6.00*					Hole Terminated at 6.00 m (Target depth reached)			
			7									
			8									
			9									

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Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH107**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7578	RL SURFACE	4 m	DATUM AHD
EXCAVATION DIMENSIONS		6.00 m depth	NORTHING	-32.9313	ASPECT		SLOPE

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
				4.00								
AD/T	L				1 ES 0.10 m			SP	FILL: SAND; fine to medium grained; brown; with clay and fine to medium grained gravels.			FILL
				0.50								
				3.50				SP	FILL: Gravelly SAND; medium grained; brown; with clay; medium to coarse grained gravels.			ALLUVIUM
			1		1 ES 0.80 m					M		
				1.50								
				2.50	1 ES 1.60 m 1 D 1.70-1.90 m			SP	SAND; fine to medium grained; pale brown/brown, trace clay.			
			2									
		19/01/21		*2.50*								
	H			1.50					Becoming pale brown.			
			3									
					1 D 3.80-4.00 m					W		
			4									
			5									
				5.50								
				-1.50					Becoming dark grey.			
					1 D 5.70-5.90 m							
			6	*6.00*								
									Hole Terminated at 6.00 m (Target depth reached)			
			7									
			8									
			9									

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Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH108**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7574	RL SURFACE	4 m	DATUM AHD
EXCAVATION DIMENSIONS		6.00 m depth	NORTHING	-32.9321	ASPECT		SLOPE

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L	19/01/21	0	4.00								
				0.20	2 ES 0.10 m			SP	FILL: SAND; fine to medium grained; brown/dark brown; with pebbles and gravels; trace clay.			FILL
				3.80	1 B 0.20-0.60 m 1 ES 0.30 m 1 D 0.40-0.60 m			SP	SAND; fine to medium grained; brown, dark brown/pale brown; with silt.			ALLUVIUM
				0.80								
				3.20	1 ES 0.90 m 1 D 1.00-1.20 m				Becoming grey/dark grey.	M	MD	
			2		1 D 2.00-2.20 m							
			3									
				3.50							MD - D	
				0.50					Pale brown.			
			4		1 D 4.00-4.20 m					W		
			5									
					1 D 5.60-5.80 m							
			6	*6.00*					Hole Terminated at 6.00 m (Target depth reached)			
			7									
			8									
			9									

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CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH109**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7596	RL SURFACE	3 m	DATUM AHD
EXCAVATION DIMENSIONS		2.00 m depth	NORTHING	-32.9319	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L	Not Encountered	0	3.00	1 ES 0.10 m			SP	SAND; fine to medium grained; grey/brown; trace clay.			ALLUVIUM
					1 ES 0.80 m							
			1	*1.00* 2.00					Pale grey/pale brown.	M	MD	
					1 ES 1.50 m							
			2	*2.00*					Hole Terminated at 2.00 m (Target depth reached)			
			3									
			4									
			5									
			6									
			7									
			8									
			9									

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Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH110**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7591	RL SURFACE	3 m	DATUM AHD
EXCAVATION DIMENSIONS		2.00 m depth	NORTHING	-32.9317	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L	Not Encountered	1	3.00 *0.30* 2.70 *1.10* 1.90 *1.50* 1.50 *2.00*	1 ES 0.10 m 1 ES 0.40 m 1 ES 1.20 m 1 ES 1.60 m			SP SP	FILL: SAND; fine grained; grey/pale brown; trace clay fragments. SAND; fine grained; grey/pale brown. Grey/brown. Brown.	M	MD	FILL ALLUVIUM
			2						Hole Terminated at 2.00 m (Target depth reached)			
			3									
			4									
			5									
			6									
			7									
			8									
			9									

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Engineering Log - BOREHOLE

CLIENT	NSW Department of Education		COMMENCED	19/01/2021	COMPLETED	20/01/2021	**REF BH111**
PROJECT	Geotechnical and Land Contamination Assessment		LOGGED	DS	CHECKED	JF	Sheet 1 OF 1
SITE	Newcastle High School		GEOLOGY	Quaternary Deposits	VEGETATION	Grass	PROJECT NO. 2007929
EQUIPMENT		4WD ute-mounted hydraulic drill rig	EASTING	151.7576	RL SURFACE	4 m	DATUM AHD
EXCAVATION DIMENSIONS		2.00 m depth	NORTHING	-32.9315	ASPECT		SLOPE

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	L	Not Encountered	0	4.00	1 ES 0.10 m			SP	FILL: SAND; fine to medium grained; brown/dark brown; with fine to medium grained gravels; trace clay.			FILL
				0.40								
				3.60				SP	SAND; fine to medium grained; grey/brown; trace clay.			ALLUVIUM
					1 ES 0.60 m							
				1.00								
			1	3.00	1 ES 1.10 m				Orange/brown.	M	MD - D	
				1.50								
				2.50					Becoming pale brown.			
				2.00								
			2						Hole Terminated at 2.00 m (Target depth reached)			
			3									
			4									
			5									
			6									
			7									
			8									
			9									

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Engineering Log - BOREHOLE

Information

Important Information About Your Report (1 of 2)

These notes have been prepared by Martens to help you interpret and understand the limitations of your report. Not all are necessarily relevant to all reports but are included as general reference.

Engineering Reports - Limitations

The recommendations presented in this report are based on limited investigations and include specific issues to be addressed during various phases of the project. If the recommendations presented in this report are not implemented in full, the general recommendations may become inapplicable and Martens & Associates accept no responsibility whatsoever for the performance of the works undertaken.

Occasionally, sub-surface conditions between and below the completed boreholes or other tests may be found to be different (or may be interpreted to be different) from those expected. Variation can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact Martens & Associates.

Relative ground surface levels at borehole locations may not be accurate and should be verified by on-site survey.

Engineering Reports – Project Specific Criteria

Engineering reports are prepared by qualified personnel. They are based on information obtained, on current engineering standards of interpretation and analysis, and on the basis of your unique project specific requirements as understood by Martens. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the Client.

Where the report has been prepared for a specific design proposal (e.g. a three storey building), the information and interpretation may not be relevant if the design proposal is changed (e.g. to a twenty storey building). Your report should not be relied upon, if there are changes to the project, without first asking Martens to assess how factors, which changed subsequent to the date of the report, affect the report's recommendations. Martens will not accept responsibility for problems that may occur due to design changes, if not consulted.

Engineering Reports – Recommendations

Your report is based on the assumption that site conditions, as may be revealed through selective point sampling, are indicative of actual conditions throughout an area. This assumption often cannot be substantiated until project implementation has commenced. Therefore your site investigation report recommendations should only be regarded as preliminary.

Only Martens, who prepared the report, are fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report, there is a risk that the report will be misinterpreted and Martens cannot be held responsible for such misinterpretation.

Engineering Reports – Use for Tendering Purposes

Where information obtained from investigations is provided for tendering purposes, Martens recommend that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document.

Martens would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Engineering Reports – Data

The report as a whole presents the findings of a site assessment and should not be copied in part or altered in any way.

Logs, figures, drawings *etc* are customarily included in a Martens report and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel), desktop studies and laboratory evaluation of field samples. These data should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Engineering Reports – Other Projects

To avoid misuse of the information contained in your report it is recommended that you confer with Martens before passing your report on to another party who may not be familiar with the background and purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Subsurface Conditions - General

Every care is taken with the report in relation to interpretation of subsurface conditions, discussion of geotechnical aspects, relevant standards and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions - the potential will depend partly on test point (eg. excavation or borehole) spacing and sampling frequency, which are often limited by project imposed budgetary constraints.

- Changes in guidelines, standards and policy or interpretation of guidelines, standards and policy by statutory authorities.
- The actions of contractors responding to commercial pressures.
- Actual conditions differing somewhat from those inferred to exist, because no professional, no matter how qualified, can reveal precisely what is hidden by earth, rock and time.

  The actual interface between logged materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

If these conditions occur, Martens will be pleased to assist with investigation or providing advice to resolve the matter.

Subsurface Conditions - Changes

Natural processes and the activity of man create subsurface conditions. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Reports are based on conditions which existed at the time of the subsurface exploration / assessment.

Decisions should not be based on a report whose adequacy may have been affected by time. If an extended period of time has elapsed since the report was prepared, consult Martens to be advised how time may have impacted on the project.

Subsurface Conditions - Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those that were expected from the information contained in the report, Martens requests that it immediately be notified. Most problems are much more readily resolved at the time when conditions are exposed, rather than at some later stage well after the event.

Report Use by Other Design Professionals

To avoid potentially costly misinterpretations when other design professionals develop their plans based on a Martens report, retain Martens to work with other project professionals affected by the report. This may involve Martens explaining the report design implications and then reviewing plans and specifications produced to see how they have incorporated the report findings.

Subsurface Conditions – Geo-environmental Issues

Your report generally does not relate to any findings, conclusions, or recommendations about the potential for hazardous or contaminated materials existing at the site unless specifically required to do so as part of Martens' proposal for works.

Specific sampling guidelines and specialist equipment, techniques and personnel are typically used to perform geo-environmental or site contamination assessments. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Martens for information relating to such matters.

Responsibility

Geo-environmental reporting relies on interpretation of factual information based on professional judgment and opinion and has an inherent level of uncertainty attached to it and is typically far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded.

To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Martens to other parties but are included to identify where Martens' responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Martens closely and do not hesitate to ask any questions you may have.

Site Inspections

Martens will always be pleased to provide engineering inspection services for aspects of work to which this report relates. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site. Martens is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction.

Soil Data

Explanation of Terms (1 of 3)

Definitions

In engineering terms, soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material does not exhibit any visible rock properties and can be remoulded or disintegrated by hand in its field condition or in water, it is described as a soil. Other materials are described using rock description terms.

The methods of description and classification of soils and rocks used in this report are typically based on Australian Standard 1726 and the Unified Soil Classification System (USCS) – refer Soil Data Explanation of Terms (2 of 3). In general, descriptions cover the following properties: strength or density, colour, moisture, structure, soil or rock type and inclusions.

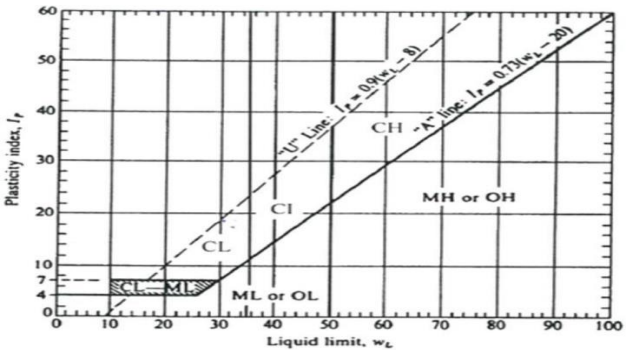
Particle Size

Soil types are described according to the predominating particle size, qualified by the grading of other particles present (e.g. sandy CLAY). Unless otherwise stated, particle size is described in accordance with the following table.

Division	Subdivision		Particle Size (mm)
Oversized	BOULDERS		>200
	COBBLES		63 to 200
Coarse Grained Soil	GRAVEL	Coarse	19 to 63
		Medium	6.7 to 19
		Fine	2.36 to 6.7
	SAND	Coarse	0.6 to 2.36
		Medium	0.21 to 0.6
		Fine	0.075 to 0.21
Fine Grained Soil	SILT		0.002 to 0.075
	CLAY		< 0.002

Plasticity Properties

Plasticity properties of cohesive soils can be assessed in the field by tactile properties or by laboratory procedures.



Soil Moisture Condition

Coarse Grained (Granular) Soil:

Dry (D):	Looks and feels dry. Cemented soils are hard, friable or powdery. Uncemented soils run freely through fingers.
Moist (M):	Feels cool and damp and is darkened in colour. Particles tend to cohere.
Wet (W):	As for moist but with free water forming on hands when handled.

Fine Grained (Cohesive) Soil:

Moist, dry of plastic limit[1] (w < PL):	Looks and feels dry. Hard, friable or powdery.
Moist, near plastic limit (w ≈ PL):	Can be moulded, feels cool and damp, is darkened in colour, at a moisture content approximately equal to the PL.
Moist, wet of plastic limit (w > PL):	Usually weakened and free water forms on hands when handled.
Wet, near liquid limit[2] (w ≈ LL)	
Wet, wet of liquid limit (w > LL)	

[1] Plastic Limit (PL): Moisture content at which soil becomes too dry to be in a plastic condition.

[2] Liquid Limit (LL): Moisture content at which soil passes from plastic to liquid state.

Consistency of Cohesive Soils

Cohesive soils refer to predominantly clay materials.
(Note: consistency is affected by soil moisture condition at time of measurement)

Term	C_u (kPa)	Field Guide
Very Soft (VS)	≤12	A finger can be pushed well into the soil with little effort. Sample exudes between fingers when squeezed in fist.
Soft (S)	>12 and ≤25	A finger can be pushed into the soil to about 25mm depth. Easily moulded by light finger pressures.
Firm (F)	>25 and ≤50	The soil can be indented about 5mm with the thumb, but not penetrated. Can be moulded by strong figure pressure.
Stiff (St)	>50 and ≤100	The surface of the soil can be indented with the thumb, but not penetrated. Cannot be moulded by fingers.
Very Stiff (VSt)	>100 and ≤200	The surface of the soil can be marked, but not indented with thumb pressure. Difficult to cut with a knife. Thumbnail can readily indent.
Hard (H)	> 200	The surface of the soil can only be marked with the thumbnail. Brittle. Tends to break into fragments.
Friable (Fr)	-	Crumbles or powders when scraped by thumbnail. Can easily be crumbled or broken into small pieces by hand.

Density of Granular Soils

Non-cohesive soils are classified on the basis of relative density, generally from standard penetration test (SPT) or Dutch cone penetrometer test (CPT) results as below:

Relative Density	%	SPT 'N' Value* (blows/300mm)	CPT Cone Value (q_c MPa)
Very loose	≤15	< 5	< 2
Loose	>15 and ≤35	5 - 10	2 - 5
Medium dense	>35 and ≤65	10 - 30	5 - 15
Dense	>65 and ≤85	30 - 50	15 - 25
Very dense	> 85	> 50	> 25

* Values may be subject to corrections for overburden pressures and equipment type and influenced by soil moisture condition at time of measurement.

Minor Components

Minor components in soils may be present and readily detectable, but have little bearing on general geotechnical classification. Terms include:

Description of components	Proportion of component in:					
	coarse grained soil				fine grained soil	
	% Fines	Terminology	% Accessory coarse fraction	Terminology	% Sand/ gravel	Terminology
Minor	≤5	Trace clay / silt, as applicable	≤15	Trace sand / gravel, as applicable	≤15	Trace sand / gravel, as applicable
	>5,≤12	With clay / silt, as applicable	>15,≤30	With sand / gravel, as applicable	>5,≤30	With sand / gravel, as applicable
Secondary	>12	Prefix soil name as 'silty' or 'clayey', as applicable	>30	Prefix soil name as 'sandy' or 'gravelly', as applicable	>30	Prefix soil name as 'sandy' or 'gravelly', as applicable

Soil Data

Explanation of Terms (2 of 3)

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Symbols for Soils and Other

SOILS


COBBLES/BOULDERS


GRAVEL (GP or GW)


Silty GRAVEL (GM)


Clayey GRAVEL (GC)


SAND (SP or SW)


Silty SAND (SM)


Clayey SAND (SC)


SILT (ML or MH)


ORGANIC SILT or CLAY (OH or OL)


CLAY (CL, CI or CH)


Silty CLAY


Sandy CLAY


PEAT (Pt)


Gravelly CLAY

OTHER


FILL


TALUS


ASPHALT


CONCRETE


TOPSOIL

Unified Soil Classification Scheme (USCS)

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 63 mm and basing fractions on estimated mass)					USCS	Primary Name
COARSE GRAINED SOILS More than 65 % of material less than 63 mm is larger than 0.075 mm	(A 0.075 mm particle is about the smallest particle visible to the naked eye)	GRAVELS More than half of coarse fraction is larger than 2.36 mm.	GRAVEL and GRAVEL-SAND Mixtures (≤ 5% fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes; not enough fines to bind coarse grains; no dry strength	GW	GRAVEL
				Predominantly one size or a range of sizes with some intermediate sizes missing; not enough fines to bind coarse grains; no dry strength	GP	GRAVEL
			GRAVEL-SILT and GRAVEL-SAND-SILT mixtures (≥ 12% fines) [1]	With excess non-plastic fines (for identification procedures see ML below); zero to medium dry strength; may also contain sand	GM	Silty GRAVEL
				With excess plastic fines (for identification procedures see CL below); medium to high dry strength; may also contain sand	GC	Clayey GRAVEL
		SANDS More than half of coarse fraction is smaller than 2.36 mm	SAND and GRAVEL-SAND mixtures (≤5% fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes; not enough fines to bind coarse grains; no dry strength.	SW	SAND
				Predominantly one size or a range of sizes with some intermediate sizes missing; not enough fines to bind coarse grains; no dry strength	SP	SAND
			SAND-SILT and SAND-CLAY mixtures (≥ 12% fines) [1]	With excess non-plastic fines (for identification procedures see ML below); zero to medium dry strength;	SM	Silty SAND
				With excess plastic fines (for identification procedures see CL below); medium to high dry strength	SC	Clayey SAND

FINE GRAINED SOILS More than 35 % of material less than 63 mm is smaller than 0.075 mm	IDENTIFICATION PROCEDURES ON FRACTIONS < 0.2 MM					
	DRY STRENGTH (Crushing Characteristics)	DILATANCY	TOUGHNESS	DESCRIPTION	USCS	Primary Name
	None to Low	Quick to Slow	Low	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or silt with low plasticity [2]	ML	SILT [3]
	Medium to High	None to Slow	Medium	Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays	CL (or CI[4])	CLAY
	Low to Medium	Slow	Low	Organic slits and organic silty clays of low plasticity	OL	Organic SILT or CLAY
	Low to Medium	None to Slow	Low to Medium	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	MH	SILT [3]
	High to Very High	None	High	Inorganic clays of high plasticity, fat clays	CH	CLAY
	Medium to High	None to Very Slow	Low to Medium	Organic clays of medium to high plasticity, organic silt of high plasticity	OH	Organic SILT or CLAY
HIGHLY ORGANIC SOILS	Readily identified by colour, odour, spongy feel and frequently by fibrous texture				Pt	PEAT

Notes:

1. Between 5% and 12% - dual classification, e.g. GP-GM.
2. Low Plasticity Clay – Liquid Limit W_L ≤35%; Medium Plasticity Clay – Liquid limit W_L >35%, ≤50%; High Plasticity Clay - Liquid limit W_L > 50%.
3. Low Plasticity Silt – Liquid Limit W_L ≤50%; High Plasticity Silt - Liquid limit W_L > 50%.
4. CI may be adopted for clay of medium plasticity to distinguish from clay of low plasticity.

Soil Data

Explanation of Terms (3 of 3)

Soil Agricultural Classification Scheme

In some situations, such as where soils are to be used for effluent disposal purposes, soils are often more appropriately classified in terms of traditional agricultural classification schemes. Where a Martens report provides agricultural classifications, these are undertaken in accordance with descriptions by Northcote, K.H. (1979) *The factual key for the recognition of Australian Soils*, Rellim Technical Publications, NSW, p 26 - 28.

Symbol	Field Texture Grade	Behaviour of moist bolus	Ribbon length	Clay content (%)
S	Sand	Coherence nil to very slight; cannot be moulded; single grains adhere to fingers	0 mm	< 5
LS	Loamy sand	Slight coherence; discolours fingers with dark organic stain	6.35 mm	5
CLS	Clayey sand	Slight coherence; sticky when wet; many sand grains stick to fingers; discolours fingers with clay stain	6.35mm - 1.3cm	5 - 10
SL	Sandy loam	Bolus just coherent but very sandy to touch; dominant sand grains are of medium size and are readily visible	1.3 - 2.5	10 - 15
FSL	Fine sandy loam	Bolus coherent; fine sand can be felt and heard	1.3 - 2.5	10 - 20
SCL$^-$	Light sandy clay loam	Bolus strongly coherent but sandy to touch, sand grains dominantly medium size and easily visible	2.0	15 - 20
L	Loam	Bolus coherent and rather spongy; smooth feel when manipulated but no obvious sandiness or silkiness; may be somewhat greasy to the touch if much organic matter present	2.5	25
Lfsy	Loam, fine sandy	Bolus coherent and slightly spongy; fine sand can be felt and heard when manipulated	2.5	25
SiL	Silt loam	Coherent bolus, very smooth to silky when manipulated	2.5	25 + > 25 silt
SCL	Sandy clay loam	Strongly coherent bolus sandy to touch; medium size sand grains visible in a finer matrix	2.5 - 3.8	20 - 30
CL	Clay loam	Coherent plastic bolus; smooth to manipulate	3.8 - 5.0	30 - 35
SiCL	Silty clay loam	Coherent smooth bolus; plastic and silky to touch	3.8 - 5.0	30- 35 + > 25 silt
FSCL	Fine sandy clay loam	Coherent bolus; fine sand can be felt and heard	3.8 - 5.0	30 - 35
SC	Sandy clay	Plastic bolus; fine to medium sized sands can be seen, felt or heard in a clayey matrix	5.0 - 7.5	35 - 40
SiC	Silty clay	Plastic bolus; smooth and silky	5.0 - 7.5	35 - 40 + > 25 silt
LC	Light clay	Plastic bolus; smooth to touch; slight resistance to shearing	5.0 - 7.5	35 - 40
LMC	Light medium clay	Plastic bolus; smooth to touch, slightly greater resistance to shearing than LC	7.5	40 - 45
MC	Medium clay	Smooth plastic bolus, handles like plasticine and can be moulded into rods without fracture, some resistance to shearing	> 7.5	45 - 55
HC	Heavy clay	Smooth plastic bolus; handles like stiff plasticine; can be moulded into rods without fracture; firm resistance to shearing	> 7.5	> 50

Rock Data

Explanation of Terms (1 of 2)

Symbols for Rock

SEDIMENTARY ROCK


BRECCIA


CONGLOMERATE


CONGLOMERATIC SANDSTONE


SANDSTONE/QUARTZITE


SILTSTONE


MUDSTONE/CLAYSTONE


SHALE


COAL


LIMESTONE


LITHIC TUFF

IGNEOUS ROCK


GRANITE


DOLERITE/BASALT

METAMORPHIC ROCK


SLATE, PHYLLITE, SCHIST


GNEISS


METASANDSTONE


METASILTSTONE


METAMUDSTONE

Definitions

Descriptive terms used for Rock by Martens are based on AS1726 and encompass rock substance, defects and mass.

Rock Material	The intact rock that is bounded by defects.
Rock Defect	Discontinuity, fracture, break or void in the material or minerals across which there is little or no tensile strength.
Rock Structure	The nature and configuration of the different defects within the rock mass and their relationship to each other.
Rock Mass	The entirety of the system formed by all of the rock material and all of the defects that are present.

Degree of Weathering

Rock weathering is defined as the degree of decline in rock structure and grain property and can be determined in the field.

Term	Symbol	Definition
Residual soil[1]	RS	Material is weathered to such an extent that it has soil properties. Mass structure, material texture, and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered[1]	XW	Material is weathered to such an extent that it has soil properties - i.e. it can be remoulded and can be classified according to the Unified Classification System. Mass structure and material texture and fabric of original rock are still visible.
Highly weathered[2]	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the original colour of the rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered[2]	MW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the rock is not recognisable. Rock strength shows little or no change from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	Rock substance unaffected by weathering. No sign of decomposition of individual materials or colour changes.

Notes:
1 RS and EW material is described using soil descriptive terms.
2. The term "Distinctly Weathered" (DW) may be used to cover the range of substance weathering between EW and SW

Rock Strength

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the direction normal to the loading. The test procedure is described by the International Society of Rock Mechanics.

Term (Strength)	I_s (50) MPa	Uniaxial Compressive Strength MPa	Field Guide	Symbol
Very low	>0.03 ≤0.1	0.6 – 2	May be crumbled in the hand. Sandstone is 'sugary' and friable.	VL
Low	>0.1 ≤0.3	2 – 6	Core 150mm long x 50mm diameter may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.	L
Medium	>0.3 ≤1.0	6 – 20	Core 150mm long x 50mm diameter can be broken by hand with considerable difficulty. Readily scored with a knife.	M
High	>1 ≤3	20 – 60	Core 150mm long x 50mm diameter cannot be broken by unaided hands, can be slightly scratched or scored with a knife. Breaks with single blow from pick.	H
Very high	>3 ≤10	60 – 200	Core 150mm long x 50mm diameter, broken readily with hand held hammer. Cannot be scratched with knife. Breaks after more than one pick strike.	VH
Extremely high	>10	>200	A piece of core 150mm long x 50mm diameter is difficult to break with hand held hammer. Rings when struck with a hammer.	EH

Rock Data

Explanation of Terms (2 of 2)

Degree of Fracturing

This classification applies to diamond drill cores and refers to the spacing of all types of natural fractures along which the core is discontinuous. These include bedding plane partings, joints and other rock defects, but exclude fractures such as drilling breaks (DB) or handling breaks (HB).

Term	Description
Fragmented	The core is comprised primarily of fragments of length less than 20 mm, and mostly of width less than core diameter.
Highly fractured	Core lengths are generally less than 20 mm to 40 mm with occasional fragments.
Fractured	Core lengths are mainly 30 mm to 100 mm with occasional shorter and longer sections.
Slightly fractured	Core lengths are generally 300 mm to 1000 mm, with occasional longer sections and sections of 100 mm to 300 mm.
Unbroken	The core does not contain any fractures.

Rock Core Recovery

TCR = Total Core Recovery

$$= \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100\,\%$$

SCR = Solid Core Recovery

$$= \frac{\sum \text{Length of cylindrical core recovered}}{\text{Length of core run}} \times 100\,\%$$

RQD = Rock Quality Designation

$$= \frac{\sum \text{Axial lengths of core} > 100 \text{ mm long}}{\text{Length of core run}} \times 100\,\%$$

Rock Strength Tests

- ▼ Point load strength Index (Is50) - axial test (MPa)
- ▶ Point load strength Index (Is50) - diametral test (MPa)
- ● Uniaxial compressive strength (UCS) (MPa)

Defect Type Abbreviations and Descriptions

Defect Type (with inclination given)

BP	Bedding plane parting
FL	Foliation
CL	Cleavage
JT	Joint
FC	Fracture
SZ/SS	Sheared zone/ seam (Fault)
CZ/CS	Crushed zone/ seam
DZ/DS	Decomposed zone/ seam
FZ	Fractured Zone
IS	Infilled seam
VN	Vein
CO	Contact
HB	Handling break
DB	Drilling break

Planarity

Pl	Planar
Cu	Curved
Un	Undulating
St	Stepped
Ir	Irregular
Dis	Discontinuous

Roughness

Pol	Polished
Sl	Slickensided
Sm	Smooth
Ro	Rough
VR	Very rough

Thickness

Zone	> 100 mm
Seam	> 2 mm < 100 mm
Plane	< 2 mm

Coating or Filling

Cn	Clean
Sn	Stain
Ct	Coating
Vnr	Veneer
Fe	Iron Oxide
X	Carbonaceous
Qz	Quartzite
MU	Unidentified mineral

Inclination

Inclination of defect is measured from perpendicular to and down the core axis.
Direction of defect is measured clockwise (looking down core) from magnetic north.

Test, Drill and Excavation Methods

Explanation of Terms (1 of 3)

Sampling

Sampling is carried out during drilling or excavation to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling or excavation provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples may be taken by pushing a thin-walled sampling tube, e.g. U_{50} (50 mm internal diameter thin walled tube), into soils and withdrawing a soil sample in a relatively undisturbed state. Such samples yield information on structure and strength and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils. Other sampling methods may be used. Details of the type and method of sampling are given in the report.

Drilling / Excavation Methods

The following is a brief summary of drilling and excavation methods currently adopted by the Company and some comments on their use and application.

Hand Excavation - in some situations, excavation using hand tools, such as mattock and spade, may be required due to limited site access or shallow soil profiles.

Hand Auger - the hole is advanced by pushing and rotating either a sand or clay auger, generally 75-100 mm in diameter, into the ground. The penetration depth is usually limited to the length of the auger pole; however extender pieces can be added to lengthen this.

Test Pits - these are excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils and, if it is safe to descend into the pit, collection of bulk disturbed samples. The depth of penetration is limited to about 3 m for a backhoe and up to 6 m for an excavator. A potential disadvantage is the disturbance caused by the excavation.

Large Diameter Auger (e.g. Pengo) - the hole is advanced by a rotating plate or short spiral auger, generally 300 mm or larger in diameter. The cuttings are returned to the surface at intervals (generally of not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube sampling.

Continuous Sample Drilling (Push Tube) - the hole is advanced by pushing a 50 - 100 mm diameter socket into the ground and withdrawing it at intervals to extrude the sample. This is the most reliable method of drilling in soils, since moisture content is unchanged and soil structure, strength *etc.* is only marginally affected.

Continuous Spiral Flight Augers - the hole is advanced using 90 - 115 mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface or, or may be collected after withdrawal of the auger flights, but they are very disturbed and may be contaminated. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability, due to remoulding, contamination or softening of samples by ground water.

Non-core Rotary Drilling - the hole is advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from 'feel' and rate of penetration.

Rotary Mud Drilling - similar to rotary drilling, but using drilling mud as a circulating fluid. The mud tends to mask the cuttings and reliable identification is again only possible from separate intact sampling (eg. from SPT).

Continuous Core Drilling - a continuous core sample is obtained using a diamond tipped core barrel of usually 50 mm internal diameter. Provided full core recovery is achieved (not always possible in very weak or fractured rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation.

In-situ Testing and Interpretation

Cone Penetrometer Testing (CPT)

Cone penetrometer testing (sometimes referred to as Dutch Cone) described in this report has been carried out using an electrical friction cone penetrometer.

The test is described in AS 1289.6.5.1-1999 (R2013). In the test, a 35 mm diameter rod with a cone tipped end is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system.

Measurements are made of the end bearing resistance on the cone and the friction resistance on a separate 130 mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are connected by electrical wires passing through the push rod centre to an amplifier and recorder unit mounted on the control truck. As penetration occurs (at a rate of approximately 20 mm per second) the information is output on continuous chart recorders. The plotted results given in this report have been traced from the original records. The information provided on the charts comprises:

(i) Cone resistance (q_c) - the actual end bearing force divided by the cross sectional area of the cone, expressed in MPa.

(ii) Sleeve friction (q_f) - the frictional force of the sleeve divided by the surface area, expressed in kPa.

(iii) Friction ratio - the ratio of sleeve friction to cone resistance, expressed in percent.

There are two scales available for measurement of cone resistance. The lower (A) scale (0 - 5 MPa) is used in very soft soils where increased sensitivity is required and is shown in the graphs as a dotted line. The main (B) scale (0 - 50 MPa) is less sensitive and is shown as a full line.

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1 % - 2 % are commonly encountered in sands and very soft clays rising to 4 % - 10 % in stiff clays.

In sands, the relationship between cone resistance and SPT value is commonly in the range:

q_c (MPa) = (0.4 to 0.6) N (blows/300 mm)

In clays, the relationship between undrained shear strength and cone resistance is commonly in the range:

q_c = (12 to 18) C_u

Interpretation of CPT values can also be made to allow estimation of modulus or compressibility values to allow calculation of foundation settlements.

Inferred stratification as shown on the attached reports is assessed from the cone and friction traces and from experience and information from nearby boreholes *etc*. This information is presented for general guidance, but must be regarded as being to some extent interpretive. The test method provides a continuous profile of engineering properties, and where precise information on soil classification is required, direct drilling and sampling may be preferable.

Standard Penetration Testing (SPT)

Standard penetration tests are used mainly in non-cohesive soils, but occasionally also in cohesive soils as a means of determining density or strength and also of obtaining a relatively undisturbed sample.

The test procedure is described in AS 1289.6.3.1-2004. The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm penetration depth increments and the 'N' value is taken as the number of blows for the last two 150 mm depth increments (300 mm total penetration). In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued. The test results are reported in the following form:

(i) Where full 450 mm penetration is obtained with successive blow counts for each 150 mm of say 4, 6 and 7 blows:

as 4, 6, 7
N = 13

(ii) Where the test is discontinued, short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm

as 15, 30/40 mm.

The results of the tests can be related empirically to the engineering properties of the soil. Occasionally, the test method is used to obtain samples in 50 mm diameter thin walled sample tubes in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

Dynamic Cone (Hand) Penetrometers

Hand penetrometer tests are carried out by driving a rod into the ground with a falling weight hammer and measuring the blows for successive 150mm increments of penetration. Normally, there is a depth limitation of 1.2m but this may be extended in certain conditions by the use of extension rods. Two relatively similar tests are used.

Perth sand penetrometer (PSP) - a 16 mm diameter flat ended rod is driven with a 9 kg hammer, dropping 600 mm. The test, described in AS 1289.6.3.3-1997 (R2013), was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.

Cone penetrometer (DCP) - sometimes known as the Scala Penetrometer, a 16 mm rod with a 20 mm diameter cone end is driven with a 9 kg hammer dropping 510 mm. The test, described in AS 1289.6.3.2-1997 (R2013), was developed initially for pavement sub-grade investigations, with correlations of the test results with California Bearing Ratio published by various Road Authorities.

Pocket Penetrometers

The pocket (hand) penetrometer (PP) is typically a light weight spring hand operated device with a stainless steel loading piston, used to estimate unconfined compressive strength, q_u, (UCS in kPa) of a fine grained soil in field conditions. In use, the free end of the piston is pressed into the soil at a uniform penetration rate until a line, engraved near the piston tip, reaches the soil surface level. The reading is taken from a gradation scale, which is attached to the piston via a built-in spring mechanism and calibrated to kilograms per square centimetre (kPa) UCS. The UCS measurements are used to evaluate consistency of the soil in the field moisture condition. The results may be used to assess the undrained shear strength, C_u, of fine grained soil using the approximate relationship:

$$q_u = 2 \times C_u.$$

It should be noted that accuracy of the results may be influenced by condition variations at selected test surfaces. Also, the readings obtained from the PP test are based on a small area of penetration and could give misleading results. They should not replace laboratory test results. The use of the results from this test is typically limited to an assessment of consistency of the soil in the field and not used directly for design of foundations.

Test Pit / Borehole Logs

Test pit / borehole log(s) presented herein are an engineering and / or geological interpretation of the subsurface conditions. Their reliability will depend to some extent on frequency of sampling and methods of excavation / drilling. Ideally, continuous undisturbed sampling or excavation / core drilling will provide the most reliable assessment but this is not always practicable, or possible to justify on economic grounds. In any case, the test pit / borehole logs represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of test pits / boreholes, the frequency of sampling and the possibility of other than 'straight line' variation between the test pits / boreholes.

Laboratory Testing

Laboratory testing is carried out in accordance with AS 1289 Methods of Testing Soil for Engineering Purposes. Details of the test procedure used are given on the individual report forms.

Ground Water

Where ground water levels are measured in boreholes, there are several potential problems:

- In low permeability soils, ground water although present, may enter the hole slowly, or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent prior weather changes. They may not be the same at the time of construction as are indicated in the report.
- The use of water or mud as a drilling fluid will mask any ground water inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water observations are to be made.

More reliable measurements can be made by installing standpipes, which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Test, Drill and Excavation Methods

Explanation of Terms (3 of 3)

DRILLING / EXCAVATION METHOD

HA	Hand Auger	RD	Rotary Blade or Drag Bit	NQ	Diamond Core - 47 mm
AD/V	Auger Drilling with V-bit	RT	Rotary Tricone bit	NMLC	Diamond Core – 51.9 mm
AD/T	Auger Drilling with TC-Bit	RAB	Rotary Air Blast	HQ	Diamond Core – 63.5 mm
AS	Auger Screwing	RC	Reverse Circulation	HMLC	Diamond Core – 63.5 mm
HSA	Hollow Stem Auger	CT	Cable Tool Rig	DT	Diatube Coring
S	Excavated by Hand Spade	PT	Push Tube	NDD	Non-destructive digging
BH	Tractor Mounted Backhoe	PC	Percussion	PQ	Diamond Core - 83 mm
JET	Jetting	E	Tracked Hydraulic Excavator	X	Existing Excavation

SUPPORT

Nil	No support	S	Shotcrete	RB	Rock Bolt
C	Casing	Sh	Shoring	SN	Soil Nail
WB	Wash bore with Blade or Bailer	WR	Wash bore with Roller	T	Timbering

WATER

▽ Water level at date shown

▷ Water inflow

◁ Partial water loss

◀ Complete water loss

GROUNDWATER NOT OBSERVED (NO)	The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.
GROUNDWATER NOT ENCOUNTERED (NX)	The borehole/test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/test pit been left open for a longer period.

PENETRATION / EXCAVATION RESISTANCE

L	Low resistance: Rapid penetration possible with little effort from the equipment used.
M	Medium resistance: Excavation possible at an acceptable rate with moderate effort from the equipment used.
H	High resistance: Further penetration possible at slow rate & requires significant effort equipment.
R	Refusal/ Practical Refusal. No further progress possible without risk of damage/ unacceptable wear to digging implement / machine.

These assessments are subjective and dependent on many factors, including equipment power, weight, condition of excavation or drilling tools, and operator experience.

SAMPLING

D	Small disturbed sample	W	Water Sample	C	Core sample
B	Bulk disturbed sample	G	Gas Sample	CONC	Concrete Core

U63 Thin walled tube sample - number indicates nominal undisturbed sample diameter in millimetres

TESTING

SPT 4,7,11 N=18	Standard Penetration Test to AS1289.6.3.1-2004 4,7,11 = Blows per 150mm. 'N' = Recorded blows per 300mm penetration following 150mm seating
DCP	Dynamic Cone Penetration test to AS1289.6.3.2-1997. 'n' = Recorded blows per 150mm penetration

Notes:

RW	Penetration occurred under rod weight only
HW	Penetration occurred under hammer and rod weight only
20/100mm	Where practical refusal or hammer double bouncing occurred, blows and penetration for that interval are reported (e.g. 20 blows for 100 mm penetration)

CPT	Static cone penetration test
CPTu	CPT with pore pressure (u) measurement
PP	Pocket penetrometer test expressed as instrument reading (kPa)
FP	Field permeability test over section noted
VS	Field vane shear test expressed as uncorrected shear strength (sv = peak value, sr = residual value)
PM	Pressuremeter test over section noted
PID	Photoionisation Detector reading in ppm
WPT	Water pressure tests

SOIL DESCRIPTION

Density		Consistency		Moisture	
VL	Very loose	VS	Very soft	D	Dry
L	Loose	S	Soft	M	Moist
MD	Medium dense	F	Firm	W	Wet
D	Dense	St	Stiff	Wp	Plastic limit
VD	Very dense	VSt	Very stiff	Wl	Liquid limit
		H	Hard		

ROCK DESCRIPTION

Strength		Weathering	
VL	Very low	EW	Extremely weathered
L	Low	HW	Highly weathered
M	Medium	MW	Moderately weathered
H	High	SW	Slightly weathered
VH	Very high	FR	Fresh
EH	Extremely high		

Douglas Partners
Geotechnics / Environment / Groundwater

Table B1: Summary of Laboratory Results - Acid Sulfate Soils (Martens, 2021)

Bore ID	Sample Depth (m)	Approximate Surface Ground Level (mAHD)	Approximate Sample RL (m AHD)	Depth to Groundwater (m bgl)	Sample Description	Screening Test Results				Laboratory Results							
						pH			Strength of Reaction[b]	pH_{KCl}	S_{KCl}	Scr %S	s-TAA %S	S_{NAS} %S	s-ANC_{BT} %S	Net Acidity[c] %S	Existing and Potential Acidity %S
						pH_F	pH_{FOX}	pH_F - pH_{FOX}									
102	3.1	3.0	-0.1	4.6	Sand	NT	NT	NT	NT	5.8	<0.005	<0.005	<0.01	NT	NT	<0.005	<0.005
	5.1		-2.1		Sand	NT	NT	NT	NT	5.6	<0.005	<0.005	<0.01	NT	NT	<0.005	<0.005
104	3.1	4.0	0.9	4.0	Sand	NT	NT	NT	NT	5.5	<0.005	<0.005	<0.01	NT	NT	<0.005	<0.005
	8.3		-4.3		Sandy Clay	NT	NT	NT	NT	5.3	<0.005	0.02	<0.01	NT	NT	0.025	0.025
105	5.6	3.0	-2.6	2.4	Clayey Sand	NT	NT	NT	NT	5.4	<0.005	0.01	<0.01	NT	NT	0.011	0.011
108	1.1	4.0	2.9	2.5	Sand	NT	NT	NT	NT	5.3	0.006	<0.005	<0.01	NT	NT	<0.005	<0.005
	2.1		1.9		Sand	NT	NT	NT	NT	5.6	<0.005	<0.005	<0.01	NT	NT	<0.005	<0.005
	5.7		-1.7		Sand	NT	NT	NT	NT	5.4	<0.005	0.005	<0.01	NT	NT	0.009	0.009
Guideline		Coarse sands, poorly buffered				<4[d]	<3.5[e]	≥1[e]	-	Coarse sands, poorly buffered							0.01
		Coarse sands to loamy sands and peats								Coarse sands to loamy sands and peats							0.03
		Medium sandy loams to light clays								Medium sandy loams to light clays							0.06[f]/0.03[g]
		Fine medium to heavy clays & silty clays								Fine medium to heavy clays & silty clays							0.1[f]/0.03[g]

Notes to Table B1:

a Depth below ground surface

b Strength of Reaction
- 1 denotes no or slight reaction
- 2 denotes moderate reaction
- 3 denotes high reaction
- 4 denotes very vigorous reaction
- F denotes bubbling/frothy reaction indicative of organics
- V denotes vapours generated
- B denotes bubbles generated
- H denotes heat generated

c Calculated by the laboratory based on the ABA equation in ASS Laboratory Methods Guidelines

d For actual acid sulphate soils (ASS)

e Indicative value only for Potential Acid Sulphate Soils (PASS)

f QASSIT Action Criteria for disturbance of 1-1000 tonnes of material

g QASSIT Action Criteria for disturbance of more than 1000 tonnes of material

Bold results indicative of ASS

Shaded results indicate an exceedence of QASSIT action criteria

pH_F - Soil pH Test (1:5 soil:distilled water)

pH_{FOX} - Soil Peroxide pH Test (1:4 soil:distilled water following oxidation of soil with 30% hydrogen peroxide (H_20_2))

NT Not tested

*Laboratory methods used to quantify ANC are likely to overestimate environmental effectiveness

martens
consulting engineers since 1989

SOIL ANALYSIS CHAIN OF CUSTODY FORM

Project												
Name	P2007929 – Newcastle High School											
Martens Contact Officer	Dean Shi					**Contact Email**	dshi@martens.com.au					
Sampling and Shipping	**Sample Date**	19 - 20 January 2021		**Dispatch Date**	29 January 2021		**Turnaround Time**	Standard				
	Our Reference	P2007929COC02V01				**Shipping Method**	**Hand**		**Post**		**Courier**	X
	On Ice (X)	X	**No Ice (X)**		**Other (X)**							
Laboratory												
Name	EnviroLab											
Sample Delivery Address	12 Ashley Street, Chatswood											
Delivery Contact	**Name**	Aileen		**Phone**	9910 6200	**Fax**		**Email**	samplereceipt@envirolabservices.com.au			
Please Send Report By (X)	**Post**		**Fax**		**Email**	X	**Reporting Email Address**	jfulton@martens.com.au dshi@martens.com.au				

	Sample ID	SCr Suite
1	BH102/3.0-3.2	X
2	BH102/5.0-5.2	X
3	BH104/3.0-3.2	X
4	BH104/8.2-4.8	X
5	BH105/5.5-5.7	X
6	BH108/1.0-1.2	X
7	BH108/2.0-2.2	X
8	BH108/5.6-5.8	X

ENVIROLAB
Environmental Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 260511
Date Received: 29/1/21
Time Received: 13:22
Received By: A
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Head Office
Suite 201, Level 2, 20 George Street
Hornsby NSW 2077, Australia
Ph 02 9476 9999 **Fax** 02 9476 8767

> mail@martens.com.au
> www.martens.com.au
MARTENS & ASSOCIATES P/L
ABN 85 070 240 890 ACN 070 240 890

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 260511

Client Details

Client	Martens & Associates Pty Ltd
Attention	Dean Shi
Address	Suite 201, 20 George St, Hornsby, NSW, 2077

Sample Details

Your Reference	**P2007929 - Newcastle High School**
Number of Samples	8 SOIL
Date samples received	29/01/2021
Date completed instructions received	29/01/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	05/02/2021
Date of Issue	05/02/2021

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Chromium Suite						
Our Reference		260511-1	260511-2	260511-3	260511-4	260511-5
Your Reference	UNITS	BH102/3.0-3.2	BH102/5.0-5.2	BH104/3.0-3.2	BH104/8.2-4.8	BH105/5.5-5.7
Date Sampled		19-20/01/2021	19-20/01/2021	19-20/01/2021	19-20/01/2021	19-20/01/2021
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/02/2021	02/02/2021	02/02/2021	02/02/2021	02/02/2021
Date analysed	-	02/02/2021	02/02/2021	02/02/2021	02/02/2021	02/02/2021
pH $_{kcl}$	pH units	5.8	5.6	5.5	5.3	5.4
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01	<0.01	<0.01
TAA pH 6.5	moles H^+ /t	<5	<5	<5	<5	<5
Chromium Reducible Sulfur	%w/w	<0.005	<0.005	<0.005	0.02	0.01
a-Chromium Reducible Sulfur	moles H^+ /t	<3	<3	<3	14	6
S_{HCl}	%w/w S	NT	NT	NT	NT	NT
S_{KCl}	%w/w S	<0.005	<0.005	<0.005	<0.005	<0.005
S_{NAS}	%w/w S	NT	NT	NT	NT	NT
ANC_{BT}	% $CaCO_3$	NT	NT	NT	NT	NT
s-ANC_{BT}	%w/w S	NT	NT	NT	NT	NT
s-Net Acidity	%w/w S	<0.005	<0.005	<0.005	0.025	0.011
a-Net Acidity	moles H^+ /t	<5	<5	<5	16	6.7
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	<0.75	1	<0.75
a-Net Acidity without ANCE	moles H^+ /t	<5	<5	<5	16	6.7
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75	<0.75	1.2	<0.75
s-Net Acidity without ANCE	%w/w S	<0.005	<0.005	<0.005	0.025	0.011

Chromium Suite				
Our Reference		260511-6	260511-7	260511-8
Your Reference	UNITS	BH108/1.0-1.2	BH108/2.0-2.2	BH108/5.6-5.8
Date Sampled		19-20/01/2021	19-20/01/2021	19-20/01/2021
Type of sample		SOIL	SOIL	SOIL
Date prepared	-	02/02/2021	02/02/2021	02/02/2021
Date analysed	-	02/02/2021	02/02/2021	02/02/2021
pH $_{kcl}$	pH units	5.3	5.6	5.4
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01
TAA pH 6.5	moles H^+ /t	<5	<5	<5
Chromium Reducible Sulfur	%w/w	<0.005	<0.005	0.005
a-Chromium Reducible Sulfur	moles H^+ /t	<3	<3	<3
S_{HCl}	%w/w S	NT	NT	NT
S_{KCl}	%w/w S	0.006	<0.005	<0.005
S_{NAS}	%w/w S	NT	NT	NT
ANC_{BT}	% $CaCO_3$	NT	NT	NT
s-ANC_{BT}	%w/w S	NT	NT	NT
s-Net Acidity	%w/w S	<0.005	<0.005	0.0090
a-Net Acidity	moles H^+ /t	<5	<5	5.5
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	<0.75
a-Net Acidity without ANCE	moles H^+ /t	<5	<5	5.5
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75	<0.75
s-Net Acidity without ANCE	%w/w S	<0.005	<0.005	0.0090

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			02/02/2021	1	02/02/2021	02/02/2021		02/02/2021	[NT]
Date analysed	-			02/02/2021	1	02/02/2021	02/02/2021		02/02/2021	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	1	5.8	5.8	0	99	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	1	<5	<5	0	98	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	1	<3	<3	0	109	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	1	NT	NT		[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	1	NT	NT		[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	1	NT	NT		[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	1	NT	NT		[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	1	<5	<5	0	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	1	<0.75	<0.75	0	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	1	<5	<5	0	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	1	<0.75	<0.75	0	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

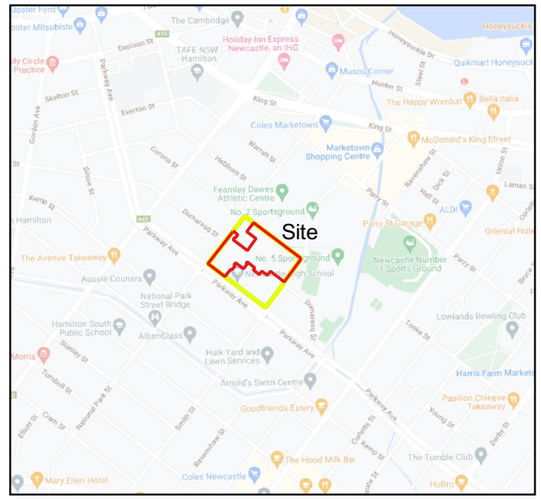
Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Appendix C

Test Location Plan (DP, 2023)
Map 01 - Testing Plan (Martens, 2021)
Site Plan – Building Work Location - EJE Architecture
(Ref 13331, C, 1A-0421-A)
Preliminary Bulk Earthworks Plan (Stantec Australasia Pty Ltd)

0 10 20 30 40 m

Drawing adapted from Metromap image dated 11.06.2022.
Test locations are approximate only and were located using Differential GPS.



Site Location

Legend

Current Investigation Test Locations

- ACM Sample
- Surface Water Sample
- Test Pit
- Hand Auger
- Groundwater Monitoring Well
- Hand Auger
- Test Pit
- Hand Augers / Hand Pits
- Surface Samples

Previous Test Locations

- Geotechnical Bore (DP, 2022b)
- Geotechnical CPT (DP, 2022b)
- Geotechnical Marten (2021)
- Investigation Area
- Site Boundary
- Lot Boundary
- Appoximate Boundary of Mapped Anthropogenic Deposits

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: School Infrastructure NSW		
OFFICE: Newcastle	DRAWN BY: PLH	
SCALE: 1:1,500 @ A3	DATE: 23.May.2023	

TITLE: **Test Location Plan and Site Features**
Newcastle High School Upgrade
25a National Park Street, Newcastle West

N

PROJECT No:	213618.02
DRAWING No:	1
REVISION:	2

Project No: P2007929 Map Set: MS04-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1500 @ A3

Aerial: Nearmap (2020)

Map Title / Figure:

Testing Plan

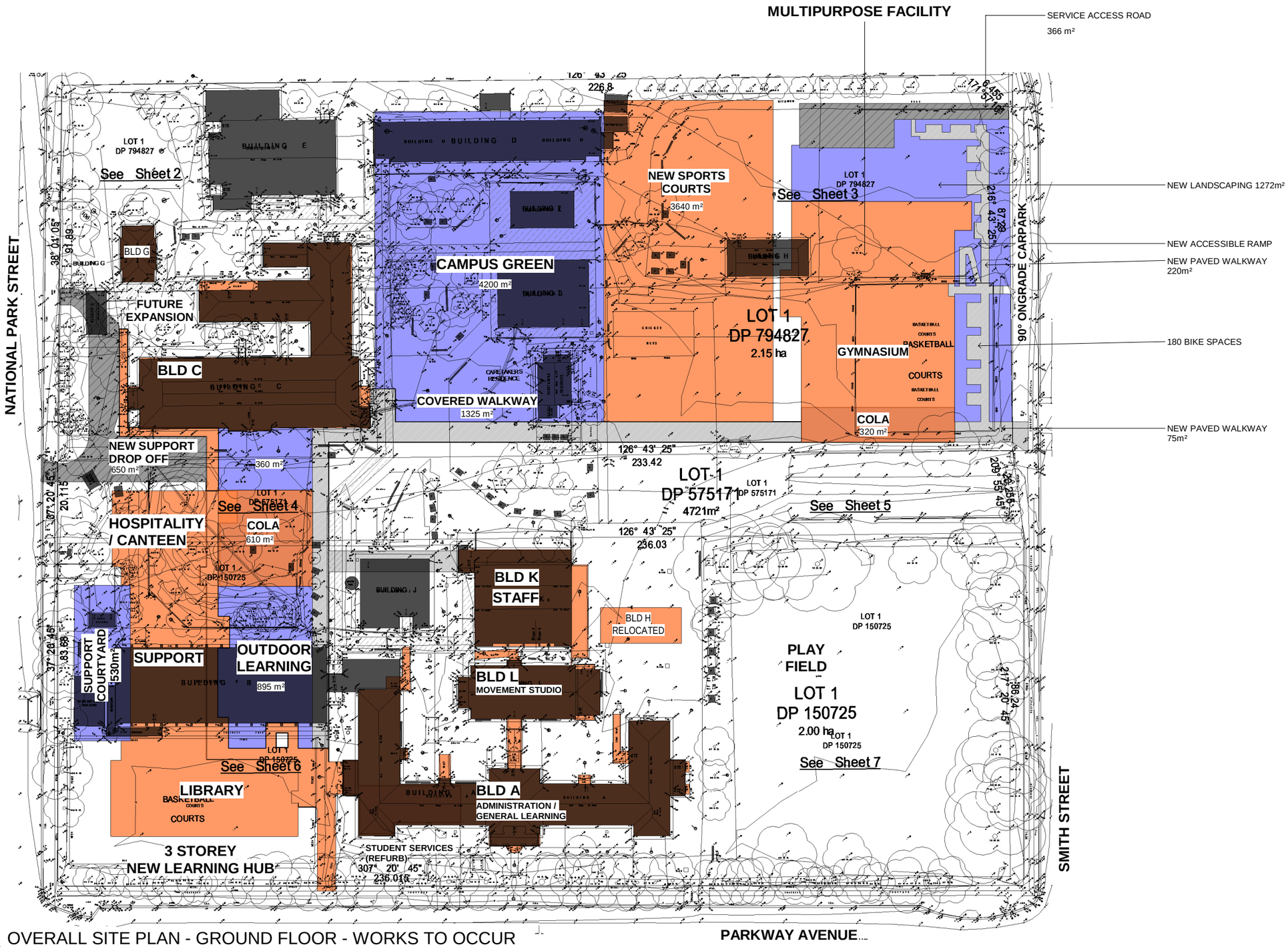
Map 01	Map
160 - 200 Parkway Avenue, Hamilton South, NSW	Site
Newcastle Education Precinct Development	Project
Geotechnical Investigation	Sub-Project
NSW Department of Education C/- SINSW	Client
25/02/2021	Date

martens
Environment | Water | Geotechnics | Civil | Projects

SITE PLAN - BUILDING WORK LOCATION

TO REFERENCE WHEN PLACING DEMOUNTABLES

LEGEND : NEW AND EXISTING WORKS	
NEW WORK TO OCCUR FOR BUILDINGS	
NEW WORK TO OCCUR FOR LANDSCAPING	
NEW AND EXITING PATHWAYS	
NEW AND EXISTING ROADS	
EXISTING BUILDINGS	



1 OVERALL SITE PLAN - GROUND FLOOR - WORKS TO OCCUR

1 : 500

EJE ARCHITECTURE

ACN 002 912 843 | **ABN** 82 644 649 849
Nominated Architect - Bernard Collins | NSW Architects Registration No: 4438
P +61 2 4929 2353 | **F** +61 2 4926 3069 | **E** mail@eje.com.au | **W** www.eje.com.au
A 412 KING STREET, NEWCASTLE, NSW 2300

0 25mm 100mm 150mm ON ORIGINAL A1

NSW GOVERNMENT Education School Infrastructure

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	10/05/2022	ISSUE FOR INFORMATION	MG	KG	

PROJECT : NEWCASTLE EDUCATION CAMPUS

SITE : 25A NATIONAL PARK STREET NEWCASTLE WEST 2302

CLIENT : DEPARTMENT OF EDUCATION NSW

DRAWING : SITE PLAN - WORKS TO BE UNDERTAKEN

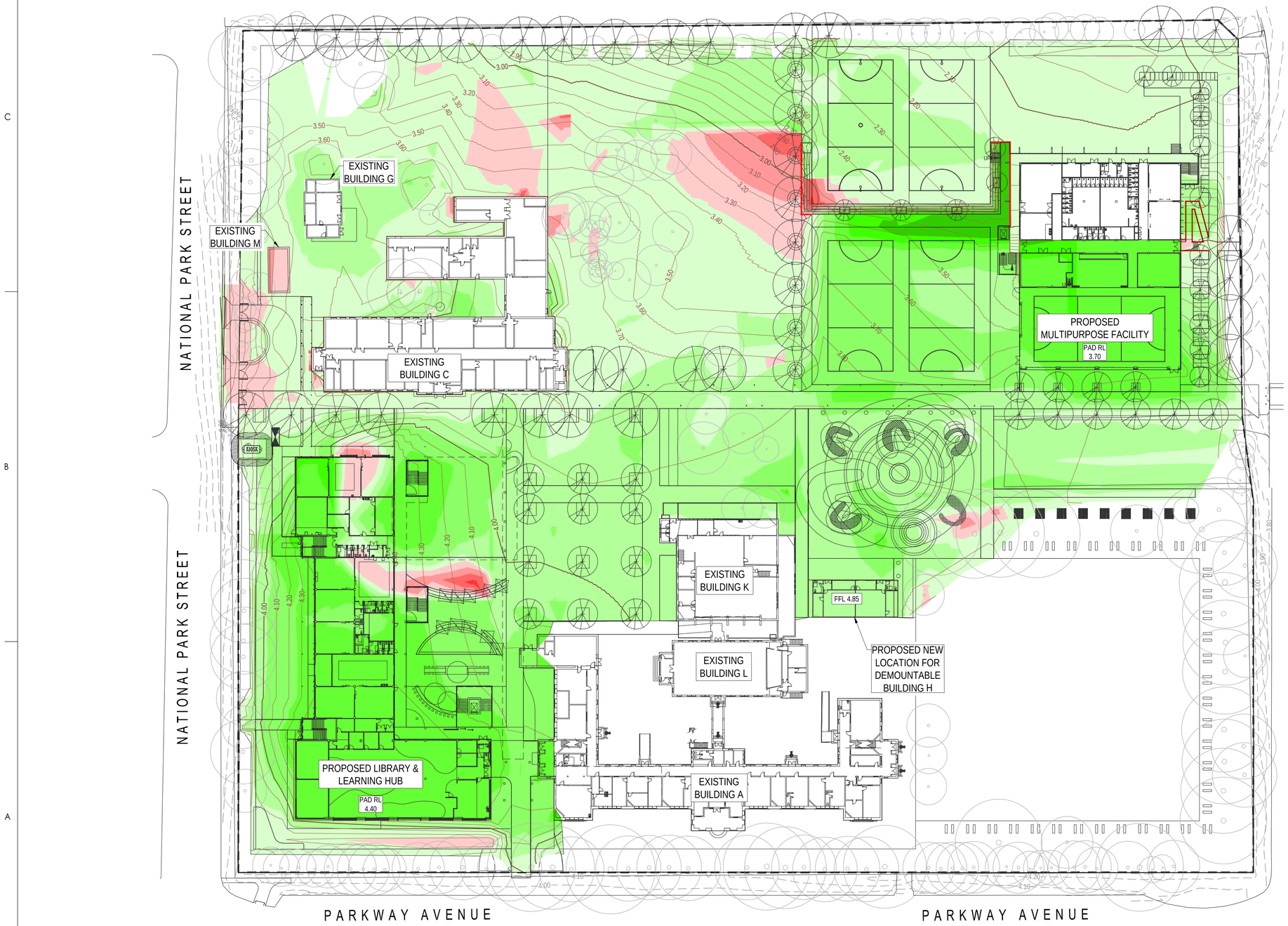
WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

P:\13331 - Newcastle Education Precinct (KMG)\EJE Documents\Working Files\Revit Files\13331 - Newcastle Education Precinct - Option 3 STR 9 - DRAWN : DATE : SCALES :

MG 10/05/22 As indicated@ A1 1:1000@ A3

PROJECT No : 13331 PHASE : C DRAWING No : 1A-042 REV : A

EJE architecture



LEGEND

- SITE BOUNDARY
- 14.0 — BULK EARTHWORKS CONTOUR
- 18.0 — EXISTING CONTOURS
- PAD RL — BULK EARTHWORKS LEVEL

NOTES

1. VOLUMES ARE INDICATIVE ONLY AND ARE BASED ON A COMPARISON BETWEEN THE DESIGN SURFACE AND THE SURVEYED SURFACE.
2. NOTE THAT ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
3. NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS.
4. NO ALLOWANCE HAS BEEN MADE FOR DETAILED EARTHWORKS; ie INFILTRATION TANKS, RAINWATER TANK, SERVICE TRENCHING, DETAILED EXCAVATION, FOOTINGS, RETAINING WALLS, PAVEMENT BOXING, BUILDING SLABS AND THE LIKE.
5. THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.
6. BULK EARTHWORKS CUT/FILL VOLUME CONSIDERATIONS:
   - 300mm TOPSOIL HAS BEEN CONSIDERED TO BE REMOVED.
   - 400mm STRUCTURAL SLAB UNDER BUILDING PADS.
   - 200mm THICKNESS FOR PAVEMENTS.
   - 200mm FOR LANDSCAPE AREAS BUILD-UPS.
5. THE SURVEY SURFACE AS PROVIDED HAS BEEN UTILISED FOR COMPARISON PURPOSES.
6. STANTEC DOES NOT TAKE RESPONSIBILITY FOR ACCURACY OF EXISTING SURVEY.

CUT AND FILL VOLUME:

CUT: 260 m^3
FILL: 8,924 m^3
NET: 8,664 m^3 (FILL)

CUT/FILL DEPTH RANGES

COLOUR	LOWER	UPPER
	-2.2	-2.0
	-2.0	-1.8
	-1.8	-1.6
	-1.6	-1.4
	-1.4	-1.2
	-1.2	-1.0
	-1.0	-0.8
	-0.8	-0.6
	-0.6	-0.4
	-0.4	-0.2
	-0.2	0.0
	0.0	0.2
	0.2	0.4
	0.4	0.6
	0.6	0.8
	0.8	1.0
	1.0	1.2
	1.2	1.4

1:500 5 0 5 10 15 20 25 A1
1:1000 A3

Key Plan: (NTS)

D	100% SCHEMATIC DESIGN RE-ISSUE	CPO	JMB	2022.10.10
C	100% SCHEMATIC DESIGN ISSUE	LPT	JMB	2022.09.23
B	90% SCHEMATIC DESIGN ISSUE	MDR	JMB	2022.08.23
A	75% SCHEMATIC DESIGN ISSUE	MDR	JMB	2022.08.02
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

PRELIMINARY

NOT FOR CONSTRUCTION

This document is suitable only for the purpose noted above.
Use of this document for any other purpose is not permitted.

Colour Disclaimer
This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result inloss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

Notes

Stantec
Stantec Australia Pty. Ltd.
Level 6, Building B
207 Pacific Highway
St Leonards, NSW 2065
Tel: +61 2 8484 7000

Client/Project Logo
NSW Government Education School Infrastructure

Client/Project
SINSW

NEWCASTLE EDUCATION CAMPUS

25A NATIONAL PARK STREET, NEWCASTLE WEST 2302

File Name: NEC-STNC-XX-XX-DR-C-100001.DWG	Dwn.	Dsgn.	Chkd.	2022.08.02 YYYY.MM.DD

Title
BULK EARTHWORKS PLAN

Project No. 301350909
Scale 1:500
Revision D
Drawing No. NEC-STNC-XX-XX-DR-C-100001

Plotted: 11/10/2022 12:45:49 PM By: DIAZ RONDE, MELISSA
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Appendix D ACOR CVs

Joshua Rhodes

BE (Hons) Civil MIEAust CPEng NER

CIVIL LEADER | NEWCASTLE GENERAL MANAGER

Qualifications

Bachelor of Engineering (Honours) (Civil), University of Newcastle

Hunter Water WSAA Accredited Water and Sewer Reticulation Designer

Affiliations

Member, Institution of Engineers Australia (MIEAust)

Chartered Professional Engineer. (CPEng)

National Engineers Register (NER-Civil)

ACOR CONSULTANTS

ENGINEERS

MANAGERS

INFRASTRUCTURE PLANNERS

DEVELOPMENT CONSULTANTS

Experience

Joshua is an Associate Principal of ACOR and a Senior Civil Engineer with experience in a wide variety of projects, in particular urban, rural and industrial Land Development, Defence, Local Government, Rail and Electrical Substation design.

His experience includes stormwater quantity and quality management, including Water Sensitive Urban Design, road and earthworks design, project management, contract administration, design, specification reviews and site supervision/inspections.

Residential & Industrial Subdivisions

Design and documentation for site works, roads and stormwater drainage at:

- Clifteigh Meadows Residential Development Cliffleigh Stages 7,8, 9a,12, 13 and 15
- Garawon Place subdivision, Fletcher
- Bower Residential Estate stages 1-5
- Sanctuary Residential Development, Fletcher (Stages 14 to 17) 152 residential lots
- Minmi Urban Release Area
  Earthworks, roads and stormwater management for land development rezoning and DA for 3,300 residential lots
- Morisset Park Residential Development
  62 residential lots
- Brush Creek Residential Development, Edgeworth
  (Stages 1-5 & 7 Precinct 2) 200+ residential lots
- Industrial Estate, Gunnedah
  19 Industrial lots
- Mornington Heights Estate, Gunnedah
  344 residential lots
- Oxley Highway, Gunnedah
  28 industrial lots

Defence Projects

- Defence Logistics Transformation Project ($350M)
  New major base entries and main road works as well as design of internal site works, roads and stormwater drainage at Moorebank NSW and Bandiana VIC
- RAAF Base Williamtown NSW – Stage 2 Redevelopment ($275M) - New major base entries & RMS main road works

Local Government

Design & documentation for site works, roads & stormwater drainage at:

- Cooranbong Cycleway, design of over 12km of cycleway from the Watagan Park development, Cooranbong to Morisset Town Centre
- Camden Valley Way, Elderslie
  1.2km dual lane road, signalised intersection and roundabout design
  - RMS road intersections and roundabouts design at:
  - Oxley Highway Gunnedah and Industrial Subdivision
- Dora Street and Ourimbah Street, Morisset (RMS review)
- Design of road works for Hunter Councils:
  - Clarence Town Road, Glen Oak for Port Stephens Council - Design of 2.2km of rural road and associated stormwater culverts
  - Clarence Town Road, Clarence Town for Dungog Council - Design of 2km of rural road and associated stormwater drains
  - East Seaham Road, Seaham 2.2km rural road and associated drainage for Port Stephens Council
- Peppertree Road, Medowie
  Road extension and intersection design and associated stormwater drainage for Port Stephens Council
- Saleyards and Fairydale Lane, Mudgee
  3 km of urban and rural road design and stormwater drainage for Mid-Western Regional Council
- Wollar Road, Wollar
  1.5 km rural road design
- Sanctuary Development stages 1 to 5B swale improvements for New Castle City Council
- North Sydney Education precinct
  Napier and Charles Street and Wheeler Lane upgrades for North Sydney council
- Stormwater Management Croudace Road, Elemovale for New Castle City council

Joshua Rhodes

- James L Boyd Reserve carpark, Swansea for Lake Macquarie City Council
- Balmoral Reserve carpark, Balmoral for Lake Macquarie City Council
- Cooranbong Cycleway approximately 10km of Cycleway from Cooranbong to Morisset

Industrial

- Civil and structural design including earthworks, compound levels, roads, stormwater drainage, secondary separation/oil containment, erosion/sediment controls, yard structures / foundations, blast walls and switch buildings at:
  - Wallerawang 132/66kV substation
  - Tomaree 33/11kV substation
  - Boggabri East switching station
  - Wollar 500/330kV substation
  - Bannaby 500/330kV substation
- Williamsdale 330/132kV substation Earthworks, temporary sediment basin and secondary containment basin design
- Daracon Headquarters and Concrete Batching Plant, Cameron Park
- Pacific National LPC Inspection and Scoping Program:
  - Hunter Bulk Terminal
  - Inner Harbour
  - Outer Harbour
- Newcastle Airport outer Harbour East Apron Expansions Concept Design
- Newcastle Airport Short stay carpark

Mining Materials Handling

- Mine pit top civil infrastructure design including stockpiles, conveyor formations, site works, earthworks, roads and stormwater management at:
  - Ashton Coal, Camberwell
  - Blakefield South Portal Hardstand
  - Drayton Coal Mine Extension, Muswellbrook

Specialist Skills

- Project Management
- Design of Stormwater Management Systems
- Design of Stormwater Quality Systems
- Road and Siteworks Design
- Design of Erosion and Sediment Controls

Ulrika Knight

BE (Hons) MIEAust

ASSOCIATE

SENIOR CIVIL ENGINEER

Qualifications

Bachelor of Engineering (Hons), University of Newcastle

Certificate of Registration under the NSW Design and Building Practitioners Regulations 2021

- Professional Engineering Registration (Civil)
- Design Practitioner Registration (Drainage, Civil Engineering)

Affiliations

Member, Institution of Engineers Australia (MIEAust)
Chartered Professional Engineer (CPEng) National Engineering Register (NER)
APEC Engineer IntPE (Aus)

CONSULTANTS

ENGINEERS
MANAGERS
INFRASTRUCTURE PLANNERS
DEVELOPMENT CONSULTANTS

Expertise

Ulrika is a Senior Civil Engineer with experience in a wide variety of infrastructure and land development projects, in particular urban, rural and industrial land development; commercial, educational and healthcare infrastructure; local government roads and stormwater drainage facilities; service stations and fuel terminals; defence projects.

Ulrika has expertise in civil design, project management, contract administration and site supervision of major works. She has developed particular skills in the management of design projects and performing quality assurance reviews of design documentation including drawings, design calculations and reports.

Key Projects

Road and Drainage Infrastructure

- RMS road intersections and roundabouts design at:
  - Masters, Pacific Highway Heatherbrae
  - Masters, Manning River Drive Taree
  - Metroll, Awaba Road Toronto
- Various detention and trunk drainage design solutions for Maitland City Council at:
  - Norm Chapman Oval, Rutherford
  - East Maitland Park
  - Hague Street, Rutherford
- Various stormwater drainage design solutions for Muswellbrook Shire Council at
  - Drainage study at Bell Street, Muswellbrook
  - Drainage study at Mill Street, Muswellbrook
  - Stormwater drainage design at Sowerby/Flanders Street, Muswellbrook
  - Stormwater drainage design at Lorne Street, Muswellbrook
  - Ogilvie Street, Denman
- Roads, car parking and stormwater drainage design various developments:
  - Seniors Living Development, Port Macquarie
  - East Maitland Dental Surgery
  - Tuncurry Caravan Park
  - Big 4 Caravan Park, Cessnock
  - Bargo RFS Station
  - Blaxland RFS Station
  - Service Station, Forbes
  - Park Avenue, Kotara - residential unit developments
  - Paterson Road, Bolwarra - residential unit developments
  - Masters Plumbers, Warners Bay - commercial development
  - Kinda Kapers, Mount Hutton - commercial development

Park and Urban Infrastructure Upgrades

- Richley Reserve Stages 1 and 2 Blackbutt Reserve, New Lambton

Residential and Industrial Subdivisions

- Coordination of planning, design and documentation for site works, roads and stormwater drainage including trunk drainage design, stormwater detention and water quality design at:
  - Warnervale – 51 residential lots
  - .Cliftleigh Stage 9A - 48 residential lots
  - Morisset Park - 62 residential lots
  - Links Road, Gunnedah - 50 residential lots
  - Radford Park, Branxton - 165 rural residential lots
  - Mornington Heights Estate, Gunnedah - 344 residential lots
  - Stonebridge Estate, Cessnock - 146 residential lots
  - Nikkinba Ridge Estate, Fletcher - 250 residential lots
  - Bennetts Green - 27 industrial lots
  - Cameron Park Estate, Cameron Park - 35 industrial lots
  - Greenleaf, Fullerton Cove - 234 lot retirement village
  - The Lake Retiremnet Resort, Wyee - 110 lot retirement village
  - Greenleaf, Belmont North - retirement village – 24 units
  - Northlakes Estate Stage 52 – 15 residential lots
  - The Sanctuary, Aberglasslyn – 250 residential lots
  - Kingfisher Grove Estate, Shortland - 45 residential units

Substations and Electrical Infrastructure

- Civil and structural design including earthworks, compound levels, roads, stormwater drainage, secondary separation/oil containment, erosion/sediment controls, yard structures/foundations, blast walls and switch buildings at:
  - Wallerawang 132/66kV for Transgrid with John Holland Group
  - Tomaree 33/11kV substation for Ausgrid
  - Wollar 500/330kV substation for Transgrid with UGL
  - Bannaby 500/330kV substation for Transgrid with UGL
  - Upper Tumut switching station with Transgrid

Ulrika Knight

Key Projects (continued)

Education Infrastructure

- St Bede's Catholic College, Chisholm Stage 1 - Civil design services for DA and CC, and construction inspections
- St Aloysius Primary School, Chisholm Stage 2 - Civil design services for CC, and construction inspections
- Gorokan Public School - Civil design services for redesign and expansion of existing carpark
- Kurri Kurri High School – Civil design services for a new carpark and associated stormwater drainage works
- Eleebana Public School - Civil design for a new disabled access ramp, concrete stairs and drainage works
- Bishop Tyrrell Anglican College - Flood study and civil design for playing fields and courts
- BER NSW Primary Schools Program - Design Phase for Hunter Region - Design manager for the civil and structural design teams. Project included the design of new halls, homebases, administration blocks, canteens, libraries, COLAs etc. at 16 schools.
- BER NSW Primary Schools Program - Construction Phase for Hunter Region - Civil and structural Inspections at various schools.
- All Saints College - St. Mary's Campus Maitland - Civil design for roads, carparking and stormwater drainage.
- St Catherine's High School Singleton - Civil design
- St Joseph's Primary School Bulahdelah - Civil design.

Mining, Industrial and Materials Handling

- PUMA Bitumen Loading Depot, Kwinana - Project design manager; civil and structural design services including earthworks, roads, stormwater drainage, detention, water quality, buildings, concrete bund walls, steel pipe supports, steel access stairs
- PUMA Diesel Depot, Kalgoorlie – Project design manager; civil and structural design services including roads, stormwater drainage, detention, buildings, concrete bunds, pipe supports
- AGC Industries Melville Island Bulk Fuel Facility – Civil design engineer: civil design services including earthworks, roads, stormwater drainage, buildings concrete bund walls and bund floor, steel access stairs
- Mine pit top civil infrastructure design including stockpiles, conveyor formations, roads and stormwater management at:
  - Ashton Coal
  - Blakefield
- Design of earthworks, site works and stormwater management for Daracon at:
  - Martins Creek Quarry
  - Ardglen Quarry
  - Cameron Park Headquarters
  - Cameron Park concrete batching plant

Defence Projects

- HMAS Harman
  This project involved the design of new Living in Accommodation (LIA) at Training 1 Standard to support the current and long-term capability needs at Harman. The civil design included site grading, earthworks, retaining walls, stormwater drainage including detention and water quality, carparking, DDA complaints and coordination of services.
- RAAF Pearce Sewer Infrastructure Works
  This project involved the assessment of the existing sewer assets located at RAAF Base Pearce and detailing and design of refurbishment works of the sewer pump stations, manholes, maintenance shafts, and replacement of existing asbestos cement rising mains. The objective of the project was to repair and replace the assets to extend the life of the sewer network on site.
- RAAF Pearce GM Facility – Source Area D Capping
  This project involved civil design and documentation for the installation of surface capping over PFAS impacted soils located within the ground's maintenance area. The civil works included site grading, earthworks including capping layer, kerbs and stormwater drainage.
- Defence Logistics Transformation Project ($350M) – project elements included new major base entries and main road works at:
  - Moorebank NSW
  - Bandiana VIC

Other Civil Engineering Projects

- The Sanctuary, Aberglasslyn - Site management and construction administration
- Ringwood Raceway, Seaham - review of earthworks and stormwater management report for DA
- Design of roads, footpaths, stormwater drainage. Retaining walls and bus stops for disabled access for Hunter Councils
- Review of design documents including drawings, design calculations and reports for numerous civil and structural projects in accordance with company's quality systems and procedures.

Specialist Skills

- Project Management of multidiscipline projects
- Management of land development and infrastructure projects
- Quality Assurance reviews of design documents
- Design and documentation of roads and site works
- Design of stormwater management systems
- Design of stormwater quality systems
- Design of erosion and sediment controls

Appendix E COUNCIL APPROVAL LETTER

Planning, Transport & Regulation. Mansfield.G
Reference: SDC2023/0006
Phone: 02 49742492

City of Newcastle

9 August 2023

Patrick Andrade
Planning Officer
Social and Infrastructure Assessments
Department of Planning and Environment
12 Darcy Street
PARRAMATTA NSW 2150

Submission via email: Patrick.andrade@dpie.nsw.gov.au

Dear Patrick Andrade

NEWCASTLE EDUCATION CAMPUS (SSD-4181431) 25A NATIONAL PARK STREET NEWCASTLE WEST

I refer to the Department of Planning and Environment's (DPE) notification of 30 June 2023, via the Major Project Portal, advising it has received an Environmental Impact Statement (EIS) for the Newcastle Education Campus on land known as 25A National Park Street Newcastle West. The State significant development application (SSD-4181431) and EIS was being publicly exhibited and City of Newcastle (CN) has been invited to provide advice on the development. I also refer to CN's letter of 2 August confirming our intentions to forward a submission on the development.

While the provisions of a development control plan do not legally apply to a State significant development, in the absence of other appropriate standards, the Newcastle Development Control Plan (NDCP) 2012 has been used by the DPE in its assessment of other State significant developments in the Newcastle Local Government Area. Furthermore, in this case the supporting documentation has had regard to various sections of the NDCP 2012.

The EIS has been reviewed and the following comments are offered for consideration by the DPE:

1. Flood management

The submitted flood report prepared by BMT has generally addressed the relevant requirements of the Newcastle Local Environmental Plan (NLEP) 2012 and the NDCP 2012. In this regard, flood modelling has been undertaken for the development which takes into consideration the cut and fill of the site to analysis flood storage, flood planning level design and impacts from the overall development. Furthermore, this analysis has been coordinated with the proposed stormwater design.

The Emergency Flood Response Plan (FERP) has considered the flood risks for the development and has made provisions for shelter in place (flood refuge) for the overall development. The ability of the building structural design to withstand flood loads at Probable Maximum Flood events have also been reviewed by structural engineers and confirmation provided indicating the new buildings can be designed to withstand flood loadings. The State Emergency Service have also been consulted.

While it is understood that proposed temporary demountable buildings (adjoining the proposed Multipurpose Facility) will be subject to a separate approval pathway, the location of these buildings is within a high-risk flood area within the site. Accordingly, it is strongly recommended that the flood risk analysis, including the FERP, should also consider the risks associated with these temporary buildings.

2. Stormwater management

The Stormwater report prepared by Stantec and associated civil and stormwater plans have generally addressed the relevant provisions of Section 7.06 -Stormwater of the NDCP 2012 and associated Technical Manual regarding stormwater detention and quality aspect. However, rainwater reuse element and tank sizes and reuse calculations have not been provided to demonstrate that the proposed tank sizing is adequate for the development. As proposed, there is ample opportunity to provide stormwater harvesting and reuse. In this regard, the development must be designed to cater for the reuse demand, generally being toilets and other site-specific use, landscape areas, waste refuge cleaning (noting that sewer connections to run-off will be required) and for indoor/outdoor washing.

3. Vehicular Access, Driveway Design and Crossing Location

It is recommended the development comply with Section 7.03 Traffic, Parking and Access of the NDCP2012 and Australian Standard AS/NZS2890 series.

The submitted swept path drawings Nos 1, 3 and 4 included (Appendix B) of the Traffic Impact Assessment (TIA) prepared by Stantec show a heavy rigid vehicle (12.5m in length) and trucks,12.5m and 9.8m in length, respectively, entering the site via National Park Street near existing Building C and from Smith Street via the existing driveways.

The following concerns are raised regarding these access arrangements:

- The truck turning areas have been drawn over the existing aerial images and have also not been indicated on the architectural plans of the development. It being noted that the use of these accesses will impact on site access, staff car parking areas and landscaped areas.
- There is a potential for vehicular conflicts with either cyclists or pedestrian at the two truck accesses from Smith Street. It is being noted the Smith Street frontage will have a desired shared path access over the footway for cyclists to access the bicycle parking and end user facility at the proposed multipurpose facility building. Moreover, Smith Street is the main point of pedestrian access to the subject site from the Union Street campus.
- Truck access to the east of Smith Street (rear of multipurpose facility building) appears to have a direct impact on the landscaped areas and bicycle parking facility.
- The proposed Porte-cohere style drop/off area driveway has been designed with footway cross fall grades over 2.5%. This design does not comply with CN's minimum design standards.

4. Traffic and parking

<u>On-Street Parking</u>

Overall, the proposed development will change the on-street and pedestrian access to the site as indicated in Appendix A – Vehicle Access Management Plan of the TIA. These changes, although generally agreed in principle by CN's Traffic and Transport team, will still require the approval of Newcastle City Traffic Committee. In this regard, further community consultation may also be required on such sensitive matters which impact on daily use of the local roads.

Moreover, the bus stop zones, proposed Porte-cohere pick-up/drop-off driveways, proposed Kiss and Ride facility and bicycle access facility will generate a big demand for

on road infrastructure. A shared path footway between Parkway Avenue and Smith Street multipurpose facility building must be provided as well as a crossing link on Smith Street at this location for students to safely cross to access/transfer between Union Street Campus and this site. In this regard, safe and accessible pedestrian footway, bus stops and associated infrastructure must be delivered by the development.

Off-street Parking

The staff parking access via Smith Street driveway and Parkway Avenue east of proposed Building A are to be maintained. However as indicated above, concern is raised regarding waste truck access and turning within the staff parking area and its associated impact on the parking provision. This impact must be reviewed and appropriately addressed.

Also, the staff car park accessed from Smith Street should be formalised to ensure that the area is futureproofed for staff parking purposes.

5. Public Domain

The following public domain works are required in connection with the development, and will be subject to separate approval under Section 138 of *Roads Act 1993*:

Works	Reason
Reconstruct new pedestrian foot path across site frontages as follows: • Entire extent of Parkway Av including provision of DDA compliant standard bus stops. • Part of National Park St at locations of redundant and new driveways and pedestrian entry locations. • Smith St between Parkway Av to the Multipurpose Facility building designed as a shared path.	To enhance pedestrian amenity and safety due to increased pedestrian demand from development.
Reconstruct kerb and gutter at locations of new and redundant driveway and at high hazard locations.	To improve street drainage, streetscape and facilitate compliant footway grades.
Provision of a pedestrian crossing on Smith St at the existing hump location and pedestrian link to the adjoining park.	To provide safe and accessible crossing for students to cross when changing between Union St Campus and this site.
On-street traffic and parking changes as proposed by the submitted Traffic Impact Assessment.	To facilitate for new development and enhance use of public transport

6. Heritage

It is recommended that appropriate conditions be included in any determination issued which address the following matters:

- All the recommendations contained in the submitted statement of heritage impact, archaeological assessment and Aboriginal cultural heritage assessment are to be individually conditioned.
- Archival photographic record of all buildings to be demolished prepared in accordance with the requirements of the NSW Heritage Office publication 'How to prepare archival records of heritage items' (1998) and the Department of Planning's publication 'Recording places of cultural significance' (1991). The record in digital form is to be submitted to CN prior to any works commencing on site.
- Prior to commencement of any works on site, the project heritage consultant is to identify any significant internal and external elements of the buildings that will be demolished for salvage and, if necessary, storage, for reuse as appropriate, including future interpretation opportunities. Removal of any items to be carried out in accordance with specific salvage methodologies provided by the built heritage specialist.
- Prior to commencement of any works on site, a temporary protection plan is to be prepared that identifies the potential risks and outlines measures to reduce the potential for damage to significant built and landscape elements (including heritage significant trees) during site preparation and the works.
- Before the issue of a construction certificate, an interpretation plan must be prepared by a suitably experienced heritage interpretation practitioner and be in accordance with the Heritage Council's 'Interpreting Heritage Places and Items Guidelines' (2005). The plan must make allowance for the display of any potential archaeology uncovered during the works, interpret the multiple uses and history of the various heritage buildings and elements on the site, in a way that is engaging, informative and readily accessible to the majority of visitors. The Interpretation Plan must be implemented prior to the issue of the Occupation Certificate.
- Informative: unexpected finds procedure for discovery of archaeological relics during works (i.e. in the event that an archaeological relic is unexpectedly discovered during works) requirement for development works to immediately stop in area of discovery, and to inform Heritage NSW and await their instruction.
- Informative: unexpected finds procedure for discovery of Aboriginal objects during works (i.e., in the event that an Aboriginal object is unexpectedly discovered during works) requirement for development works to immediately stop in area of discovery, and to inform Heritage NSW and await their instruction.

7. Social impacts assessment

7.1 Literature review, community engagement and social baseline

As part of the literature review of the Social Impact Assessment (SIA), the inclusion of a comprehensive set of state and local government policy and planning documents, including the CN Community Strategic Plan, draft Local Social Strategy and draft Social Infrastructure Strategy (SIS) are welcomed. While the SIA took note of the draft SIS *"Action 4.3.4 - Investigate opportunities to increase access to non-Council owned community spaces for public use through shared and joint use arrangements and agreements and equitable fees and charges"* as relevant to the proposed development, further consideration should be given to best practice trends regarding social infrastructure into the development such as:

- Multipurpose, shared and flexible design of social infrastructure to allow for a range of services and programs to be delivered to diverse community groups.
- Shared use of social infrastructure to increase usage of facilities.
- Co-location within community hubs for the integration of public space, community facilities and services in one location.

As part of the community engagement approach, it is noted the low levels of participation by surrounding residents, despite stakeholder engagement activities that included numerous community updates and works notifications, newspaper articles and letter box drops. It is agreed with the report authors this may be indicative of disengagement with the development or Newcastle High School (NHS) generally. Increased resident engagement

is recommended, particularly to encourage equitable community use of the shared school infrastructure by the wider community, as well as those experiencing disadvantage and/or representative of diverse community groups.
It is noted the comprehensive demographic and social baseline prepared as part of the SIA and the intended use of this baseline to measure eventual social change as a result of the Project. It is not clear what is the SINSW or NHS's planned approach to measure this eventual change. CN would be interested to remain informed on its progress in measuring this social change over time.

7.2 Social impact assessment ratings and mitigation and enhancement measures

While the ratings assigned to the various social impacts as per the NSW DPE SIA Guideline Assessment Matrix are generally agreed with, the following points are raised for consideration:

- *Social impact: The project may impact on Aboriginal cultural heritage.*

  The SIA report has assigned this a significance rating of Medium B1, which we believe to be incorrect as the likelihood score was "Possible" and the magnitude rating was "Minor" which should then score as a Medium C2 (as per the Social impact significance matrix pictured below).

  The development of an Aboriginal heritage management plan is welcomed as the loss of cultural heritage items would be of considerable impact to local Aboriginal people as they, and the wider community, value these items highly. As such, it is recommended the magnitude rating of this social impact to be changed to a Moderate, rather than Minor.

- *Social Impact: The Project will provide additional community infrastructure that may improve liveability.*[1]

  While the significance rating of High B3 for this possible social impact is supported, the following matters regarding the 'mitigation and enhancement measures' proposed should be considered:

  Measure 1: Implement the NSW Department of Education's Community Use of School Facilities policy to promote utilisation of new facilities.
  It is not clear how will the implementation of this policy be rolled out. Will there be greater opportunities for local residents and those from vulnerable community groups to benefit from this?

  Measure 2: Continue to work with the City of Newcastle Council to investigate funding of joint use facilities.
  Clarification is required on what is meant by investigating funding of joint use facilities.

  Measure 3: Work with the City of Newcastle Council to develop a licence agreement for community use of the outdoor multipurpose courts.
  This measure is welcomed by CN.

- *Social Impacts: The Project may impact the health and wellbeing of students, staff and residents due to additional noise; decreased air quality.*

  It is agreed that students, staff and surrounding residents will experience some negative impact during the construction phase. The rating of High C3 is appropriate.

  As per the mitigation measures proposed, it is noted the Construction Management Plan will be prepared prior to Construction Certificate, as well as the development

of an issues register and maintaining ongoing proactive communication with surrounding residents to identify emergent issues before they escalate.

These measures are supported and emphasises the need to ensure open and clear communication channels with local residents, who may be unsure how to raise any concerns they may have.

- *Social Impact: The Project may provide employment for the local construction workforce and will have a positive impact on local business and retailers.*

  The enhancement measure which seeks to increase the number of construction jobs available to diverse groups, including women, Aboriginal people and young people from the local region is welcomed. However, clarification is required on how many construction jobs are estimated to be created.

- *Social Impact: The Project will continue to provide opportunities for community and key stakeholder input and comment.*

  The development of a comprehensive working draft community engagement and communications plan to effectively manage engagement and communication throughout each phase of the project is welcomed. Efforts to engage local residents who were not as involved during the initial community consultation would be good. Furthermore, opportunities to continue community engagement once construction of the development is complete, to strengthen community ties between NHS and the broader community should be considered.

8. Trees

8.1 Canopy cover

According to the EIS and supporting Landscape Design Report (LDR), the development involves the removal of 94 trees which will be replaced by 117 trees, thereby increasing the existing canopy cover from 24% to 31%. It is noted that Figure 4 - Proposed plant schedule and images refer to tree, shrubs/ groundcovers. The associated Landscape Schematic Concept drawings identifies the locations of 'proposed new trees' but not their species. It is recommended that the drawings include a table which indicate each proposed tree, its species and pot size. It is also recommended that the LDR include a statement which indicates the anticipated time for such plantings to reach maturity and achieve the above canopy cover target.

The application is supported by an Arborist Report (AR) prepared by Joeseph Pidutti, Consulting Arborist. The report has undertaken an assessment of the impact of the development on the existing trees on site. The report identifies the retention value of each of the 276 trees on site and identifies those trees that are to be retained or removed. In undertaking this assessment including the provision of compensatory plantings consideration has been given to Section 5.03 Vegetation Management Plan of the NDCP 2012 and associated Urban Forest Technical Manual.

The report indicates that of the 97 trees proposed to be removed 22 trees have been assessed with moderate or high retention value, but their removal ' *would be mostly only be noticeable from within the school ground from within the school grounds'* and *'their removal would not significantly diminish from the nature of the neighbourhood and replacement with new plantings will compensate for their removal and provide a positive contribution to the amenity of the area.'* Notwithstanding this, in the interest of minimising the impact on the existing canopy cover on the site, it is recommended that the Applicant give further design consideration to retaining more of the trees having a moderate or high retention value.

It is further noted that LDR makes no reference to the Arborist Report. It is recommended that the LDR indicate how each of the recommendations of the AR have been addressed in the Landscape Schematic Concept drawings.

8.3 Street trees

A street tree is located on the National Park and Smith Street frontages of the site. Both trees appear are to be retained and protected in accordance with Section 8.0 Protection Measures of Part B Public Trees of the Newcastle Urban Forest Technical Manual. The tree protection fencing must remain in place and be maintained until all works have been completed, with no waste materials washouts, equipment or machinery to be store within the fenced area. No pruning of a public tree is to occur without prior consent from CN's City Greening Services.

9. Development Contributions

CN's Section 7.12 Development Contributions Plan commenced on 1 January 2022 and applies to all land within the Newcastle City Council LGA. A levy of 1% applies to non-residential developments having a cost more than $200,000.

The EIS acknowledges the applicability of the plan to the development but seeks an exemption principally on the grounds that it is best practice to exempt community infrastructure from paying contributions. In this regard, reference is made to Circular D6 'Crown Development Applications and Conditions of Consent' issued by the former Department of Urban Affairs and Planning in 1995.

This circular is the government's guiding document in relation to '*where councils intend to levy contributions on Crown developments'* under former Section 94, now known as Section 7.11, of the Environmental Planning and Assessment Act 1979. It also states that if a contribution is required for an educational establishment under a Section94 development contributions plan, that justification is required. However, this circular predates the introduction of development contributions being levied under section 94A, now known as Section 7.12.

Educational establishments are a development type captured under City of Newcastle's Section 7.12 development contributions plan and are not an exempt form of development. A Section 7.12 levy under the above plan, unlike a section 7.11 levy above, is not required to demonstrate a nexus between the proposed development and imposition of the levy. Therefore, the imposition of a levy is appropriate and it is recommended the Applicant is required to submit a cost report in accordance with the plan.

It is recommended that the Applicant is required to respond to the various matters raised in this letter.

If you have any questions in relation to this letter, please contact Geof Mansfield Development Assessment Section Manager on 4974 2767 or by email on gmansfield@ncc.nsw.gov.au .

Yours faithfully

P. Emmett

Priscilla Emmett
CITY WIDE DEVELOPMENT ASSESSMENT MANAGER

A.9 Aboriginal Cultural Heritage Management Sub-Plan (ACHMSP)

Newcastle Education Campus

Aboriginal Cultural Heritage Management Sub-Plan

Prepared for NSW Department of Education

March 2024

Newcastle Education Campus

Aboriginal Cultural Heritage Management Sub-Plan

NSW Department of Education

E220193 RP#1

March 2024

Version	Date	Prepared by	Approved by	Comments
1	19 December 23	Mikhaila Chaplain	Alan Williams	-
2	21 March 24	Joel Mason	Alan Williams	

Approved by

Dr Alan Williams FSA FRSA FRSN MAACAI MAIATSIS MEIANZ
Technical Lead, Aboriginal Heritage
21 March 2024

Ground floor 20 Chandos Street
St Leonards NSW 2065
PO Box 21
St Leonards NSW 1590

This document at a glance

ES1.1 Purpose of document

The NSW Department of Education (the proponent) is proposing to upgrade the existing Newcastle High School, 25a National Park Street, Newcastle West, NSW, to create a new Newcastle Education Campus. As part of the approval for this project, an Aboriginal cultural heritage management sub-plan (ACHMP) is required to provide a framework for managing Aboriginal heritage during the pre-construction and construction phases of the project.

This document has been developed to address these conditions. To conform with the conditions of SSD-41814831, the proponent commits to implementing the requirements of the ACHMP prior to and during the proposed development activities.

ES1.2 Summary of Aboriginal heritage

Previous investigation has identified two Aboriginal sites within the project area (and labelled as NEC AS 1 and NEC BS1). NEC BS1 consisted of a low-density stone artefact scatter (<5/m^2) found in the upper soil profile and extending across the project area. NEC AS 1 was a moderately significant artefact scatter, with localised densities of >20/m^2 and found in the northeastern/eastern corner of the project area.

The proposed development would have adverse impacts to both sites, although portions of the site would be unaffected by the works.

ES1.3 Project specific Aboriginal heritage requirements

- One project specific mitigation measure is required **prior to the construction phase**:
  - Archaeological excavations across NEC AS 1 in the north eastern/eastern corner of the project area to be implemented, as presented in Figure 4.1 and methods outlined in Section 4.2.1 and Appendix D.

ES1.4 General Aboriginal heritage requirements

The ACHMP outlines a number of general requirements to be implemented **during construction** (Section 4):

- requirements for establishing and maintaining suitable cultural inductions and awareness for all contractors and visitors during the project (Section 4.3.1)
- protocols and procedures for unexpected finds, such as skeletal/human remains (Section 4.3.2)
- protocols for undertaking activities in areas that have not been previously assessed (Section 4.5).

ES1.5 Other useful information

The ACHMP also provides guidance on:

- processes to maintain ongoing consultation with the project's RAPs and Heritage NSW (Section 2)
- other administrative requirements, including ongoing compliance, regular review and update of the ACHMP to ensure its functionality is maintained through the project (Section 5).

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1 Introduction

1.1 Purpose of document

NSW Department of Education (the proponent) is proposing to upgrade the existing Newcastle High School, 25a National Park Street, Newcastle West, NSW, to create a new Newcastle Education Campus (Figure 1.1). As part of the assessment process needed to obtain the approval for these works to proceed, investigation of Aboriginal cultural heritage for the project area was undertaken by EMM Consulting Pty Ltd (EMM).

These previous investigations consisted of an Aboriginal Cultural Heritage Assessment (ACHA) developed in consultation with the local Aboriginal community and included a range of on-site investigations to identify tangible and intangible cultural heritage (EMM 2023). Further details of the report and its findings are presented in Section 3.1. The report recommended that an Aboriginal cultural heritage management plan (ACHMP) be developed following the approval to provide a framework for managing Aboriginal heritage during the pre-construction and construction phases of the project. This recommendation has now been included in the State Significant Development Approval (SSDA), albeit named a 'sub-plan' to align with the broader environmental management system (Section 1.1.1).

This document has been developed to address these conditions, and provides guidance on:

- processes to maintain ongoing consultation with the project's registered Aboriginal parties (RAPs) and Heritage NSW (Section 2)
- management procedures for Aboriginal cultural heritage values within, and adjacent to, the project area during pre-construction and construction phases (Section 4)
- protocols and procedures for unexpected finds, such as human remains (Section 4.3)
- protocols for undertaking activities in areas that have not been previously assessed (Section 4.5)
- other administrative requirements, including post-project management of Aboriginal finds and recovered material, ongoing compliance, regular review and update of the ACHMP to ensure its functionality is maintained through the project (Section 5).

1.1.1 Legislative context

The project has been assessed and approved under State Significant Development (SSD) as defined in the *Environmental Planning and Assessment Act 1979*. DPE has provided the following identifiers for the approvals: **SSD-41814831.**

Aboriginal heritage is managed under the *National Parks and Wildlife Act 1974*. The SSD process 'switches off' a number of requirements under this Act, including the need to obtain Aboriginal heritage impact permits (AHIP) to harm Aboriginal objects. Rather, Aboriginal heritage is managed by the Conditions of Approval (CoA) provided in the SSDA (Table 1.1).

A range of other Commonwealth and State legislation also applies to Aboriginal heritage, although none have been identified as pertinent to this project. These are further outlined in the ACHA (EMM 2023).

Table 1.1 The project conditions of the SSDA that this document applies to

Requirement	Section addressed
A8. Where conditions of this consent require consultation with an identified party, the Applicant must:	Consultation has been in accordance with this condition. See section 2, 4 and Appendix A.

a) Consult with the relevant party prior to submitted the subject document for information or approval; and b) Provide details of the consultation undertaking including: i) the outcome of that consultation, matters resolved and unresolved; and ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.	
B14(c). an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communication	An unexpected finds protocol for Aboriginal heritage and associated communication has been provided in Section 4.3.2.
B19. The Aboriginal Cultural Heritage Management Sub-Plan (ACHMSP) must address, but not be limited to, the following:	This document
a) be prepared by a suitably qualified and experienced person/s;	This document was prepared by Mikhaila Chaplain, Joel Mason and Dr Alan Williams, archaeologists with EMM Consulting Pty Ltd. See Appendix G.
b) be prepared in consultation with Registered Aboriginal Parties;	Section 2 and Appendix A
c) the recommendations of the Aboriginal cultural heritage assessment report prepared by EMM dated April 2023;	The relevant recommendations in the ACHA have been incorporated in this plan, including the development of the ACHMP, consultation with Aboriginal participants (Section 2), archaeological salvage (Section 4.2) and recovery of cultural materials (Section 4.4), and various reporting requirements (Section 4). Recommendations in relation to heritage interpretation and inclusions of requirements in the Construction Environmental Management Plan are included in their respective documents, rather than this ACHMP.
d) historical archaeological excavations and must be undertaken by suitably qualified and experienced professional, in accordance with the requirements of the Heritage NSW within the Aboriginal sites identified within the Aboriginal Cultural Heritage Assessment prepared by EMM dated April 2023.	This is assumed to relate to the *Aboriginal* archaeological excavations outlined in EMM's (2023) ACHA focussing on the northeast corner of the Project area. These are presented in Section 4.2.
B26. Prior to the commencement of construction, the Applicant must consult with Registered Aboriginal Parties to determine specific requirements and management measures to be used during construction, including protection of any objects or items in perpetuity.	Sections 2, 4 and Appendix A.
C27. Construction must be undertaken in accordance with the recommendations of the Aboriginal Cultural Heritage Assessment Report prepared by EMM dated April 2023.	The relevant recommendations in the ACHA have been incorporated in this plan, including the development of the ACHMP, consultation with Aboriginal participants (Section 2), archaeological salvage (Section 4.2) and recovery of cultural materials (Section 4.4), and various reporting requirements (Section 4). Recommendations in relation to heritage interpretation and inclusions of requirements in the Construction Environmental Management Plan are included in their respective documents, rather than this ACHMP.
C28. In the even that surface disturbance identifies a new Aboriginal object: a) all works must halt in the immediate area to prevent any further impacts to the object(s);	Section 4.3.2

b) a suitably qualified archaeologist and the registered Aboriginal representative must be contacted to determine the significance of the objects;

c) the site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by Heritage NSW under Department of Premier and Cabinet and the management outcomes for the site included in the information provided to AHIMS;

d) the Applicant must consult with the Aboriginal community representatives, and the archaeologists and Heritage NSW to develop and implement management strategies for all objects/sites; and

e) works may only recommence with written approval of the Planning Secretary.

1.2 Key stakeholders

This section outlines the project team that will be involved in the project and Aboriginal stakeholder individuals and/or organisations relevant to the project (Table 1.2).

Table 1.2 Key stakeholder contact details

Personnel	Organisation	Role	Telephone contact	E-mail contact
Project team				
Meaghan Bennett*	NSW Department of Education	Project Director	0435 022 710	Meaghan.Bennett3@det.nsw.edu.au
Anthony Harrigan	The APP Group	Project Manager	0498 037 408	Anthony.Harrigan@app.com.au
Alan Williams	EMM	Heritage consultant	0438 104 740	awilliams@emmconsulting.com.au
Nicole Davis	Heritage NSW	Heritage regulator	02 4927 3156	Nicole.Davis@environment.nsw.gov.au
Patrick Andrade	DPE	Planning regulator	02 9995 6454	Patrick.andrade@planning.nsw.gov.au
Robert Petersen	Hansen Yuncken	Development contractor	0431 500 923	Rpetersen@hansenyuncken.com.au
Registered Aboriginal parties				
Matt Syron	Awabakal Local Aboriginal Lands Council	Aboriginal representative	0416 330 099	culture@awabakallalc.com.au; reception@awabakallalc.com.au
Peter Leven	Awabakal Descendants Traditional Owner Aboriginal Corporation	Aboriginal representative	0405 149 684	awabakal.to@gmail.com
Tracey Howie and Kerrie Brauer	Awabakal & Guringai Pty Ltd	Aboriginal representative	0404 182 049/ 0412 866 357	tracey@guringai.com.au
David Ahoy	Lower Hunter Aboriginal Incorporated	Aboriginal representative	0431 764 850	lowerhunterai@gmail.com
Lilly Carroll and Paul Boyd	Didge Ngunawal Clan	Aboriginal representative	0426 823 944	didgengunawalclan@yahoo.com.au

Table 1.2 Key stakeholder contact details

Personnel	Organisation	Role	Telephone contact	E-mail contact
Marilyn Carroll-Johnson	Corroboree Aboriginal Corporation	Aboriginal representative	0415 911 159	corroboreecorp@bigpond.com
Steven Johnson	Woka Aboriginal Corporation	Aboriginal representative	0406 991 221	wokacorp@yahoo.com
Phil Khan,	Kamilaroi Yankuntjatjara Working Group	Aboriginal representative	0434545982/ 0451068480	philipkhan.acn@live.com.au
Carolyn Hickey	A1 Indigenous Services	Aboriginal representative	0411 650 057	Cazadirect@live.com
Darleen Johnson	Murra Bidgee Mullangari Aboriginal Corporation	Aboriginal representative	0497 983 332	murrabidgeemullangari@yahoo.com.au

* It is the responsibility of these individuals to ensure the ACHMP is implemented, adopted and maintained through the project.

KEY

Newcastle High School

Where ACHMP applies

Areas to which this ACHMP applies

Source: EMM (2023); DFSI (2021); Metromap (2023)

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GDA2020 MGA Zone 56

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Newcastle Education Precinct
Aboriginal Cultural Heritage Management Plan
Figure 1.1

EMM creating opportunities

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2 Aboriginal consultation

2.1 At a glance

- This project has an established list of registered Aboriginal parties (RAPs) that require ongoing consultation during the pre-construction and construction phases of the project. A list of the stakeholders and their contacts are presented in Table 1.2.
- The RAPs require consultation during the finalisation of, and any updates to, the ACHMP; as part of any cultural inductions; as part of additional artefact collection prior to construction; and in the event of any unexpected finds being encountered. Timing for notification of each of these activities is provided in Table 2.1.
- Table 2.2 provides a list of dates that are important to the Aboriginal community, and during which works requiring their participation should be delayed/cancelled to avoid any potential conflict.

2.2 Consultation up to the SSDA

As a requirement of the assessment process, the ACHA undertook consultation with RAPs which provided opportunities to review Aboriginal heritage documentation, including the ACHA, and participating in the on-site activities. As part of the ACHA process, a range of feedback around post-approval requirements was provided by the RAPs, and this has been integrated into this document.

2.3 Consultation required following the SSDA

Table 2.1 provides the required Aboriginal consultation to be implemented prior to, and during construction activities. Any Aboriginal consultation undertaken as part of these activities should be documented in Appendix A.

Table 2.2 provides a list of dates that are culturally sensitive, and when works requiring Aboriginal heritage input and/or participation should be avoided.

Table 2.1 Aboriginal consultation to be undertaken as part of the project.

Project stage	Activity	Type and preferred method of communication	Comment period to be provided
Pre-construction	Development of ACHMP	A provision of a draft copy of the document to be provided for comment for detailed review, and any other consultation activities sought during initial discussions with the registered Aboriginal parties (eg in-person or online meetings, etc).	3 weeks
	Finalisation of ACHMP	Provision of final report via e-mail and/or post prior to its implementation.	1 week
Pre-construction/ construction	Updates to the ACHMP (as required)	Initial notification via phone/e-mail to advice of proposed update. Provision of updated ACHMP for review and inputs via e-mail and/or post. Where significant changes are proposed, a face-to-face meeting should be offered.	3 weeks
	Additional assessment outside of approved areas (as required)	Initial notification via phone/e-mail to advice of proposed areas outside of approved project area. Provision of a detailed description, including appropriate maps, of the new areas and proposed assessment methods and reporting. Where significant changes are proposed, a face-to-face meeting and/or on-site investigations should be offered.	3 weeks
	Archaeological excavations	An archaeological program is proposed in the northeastern/eastern portion of the project area, and for which four RAP representatives will be required (Section 4). Initial notification via phone/e-mail to advice of the schedule of the proposed program, followed by further excavation details, timing, personnel required, and relevant engagement and subcontract documentation, etc, via e-mail/post.	2-4 weeks
Construction	Cultural awareness inductions	Request for a representative to conduct inductions should be made at least 7 days prior to the required date via phone and/or e-mail.	Ongoing, with a minimum of one week's notice when required
	Unexpected finds, non-conformance	Contact all RAPs via phone and e-mail to advice of any unexpected finds and proposed management. This may include invitation to undertake on-site observations and/or face-to-face meetings where significant cultural materials, such as human remains are discovered.	Within 2 days of find
	Other activities as required	Initial notification/discussion via phone and e-mail followed by provision of documentation for review as required. Where significant or major changes, suitable face-to-face meetings and/or on-site observation should be provided.	≥2 weeks

Table 2.2 Culturally sensitive dates during which activities requiring Aboriginal heritage inputs/participation should be avoided.

Dates	Activity	Description
26 January	Invasion Day	Also known as Australia Day, the public holiday and surrounding days, are increasingly seen as a time of trauma for Aboriginal people, and any work activities should be re-scheduled to avoid this date.

Table 2.2 Culturally sensitive dates during which activities requiring Aboriginal heritage inputs/participation should be avoided.

Dates	Activity	Description
27 May – 3 June	National Reconciliation Week, includes Sorry Day	A week during which Australians are encouraged to learn about shared histories, cultures, and achievements, and to explore how one can contribute to achieving reconciliation in Australia. Aboriginal people are often committed to activities during this week and will often be unavailable.
First Sunday – Second Sunday July	NAIDOC week	A week during which Australians are encouraged to celebrate Aboriginal history, cultural and achievements. Aboriginal people are often committed to activities during this week and will often be unavailable.
-	Sorry business	Sorry business is when a member of the Aboriginal community has passed away, and includes the funeral, mourning period and other related associated activities. The timing for these is unknown and can be variable, but when advised that there is Sorry business, the project activity should be postponed.

3 Aboriginal cultural heritage within the project area

3.1 At a glance

- The ACHA undertaken as part of the SSDA assessment identified two Aboriginal sites within the project area which would both be directly impacted by the proposed works. NEC BS1 includes low significance stone artefacts of low densities across the project area, and NEC AS 1, an artefact scatter of higher densities in the northeastern/eastern corner of the project area which is considered of moderate significance.
- The proposed development would have adverse impacts to NEC BS 1 and NEC AS 1, although portions of the site would be unaffected by the works.
- As part of the ACHA process, a range of additional archaeological actions were discussed and have been integrated into the ACHMP, including archaeological excavations in areas of impact across NEC AS 1, and the consideration of an interpretation strategy to incorporate Aboriginal heritage values into the development.

3.2 Summary of Aboriginal heritage

As part of the SSDA assessment, an ACHA was undertaken in broad accordance with Heritage NSW guidelines. This included consultation with the Aboriginal community, desktop review of the regional archaeological record and on-site investigations (field survey and test excavations) to identify and assess the cultural heritage within the project area.

The desktop information from the broader region indicates that the cultural material, where present, would be primarily in the form of stone artefacts and shell middens. These may be present on the surface or in the upper soil profile (<100 cm below current surface). These would generally be found associated with water resources. Archaeological evidence confirms the Hunter River estuary foreshore was highly utilised by Aboriginal people with reasonable prediction that Aboriginal camp sites would have extended along the original shoreline and into the nearby hinterland.

Targeted archaeological excavations across primarily the northeast and southwest of the project area were undertaken – where development activities are proposed – including 13 test pits on a 10m grid and found 32 stone artefacts in total. Excavations in the southwest was typically heavily disturbed to depths of >80cm, with the northeast corner including historical topsoil above podsol at extended depths of 1.5m below current surface into under-lying dune subsoils. The artefacts discovered were found at the depths of ~50-80cm below the current surface within the under-lying podsol and included primarily of Nobby's Tuff and silcrete raw materials that retained characteristics of use in the late Holocene (<5,000 years ago). Although OSL ages for the soil profile suggest ages of >13 for the assemblage. (Future resolution of this disparity would form part of the future stages). The stone artefacts were found in low densities (<5/m^2) across the site, with three closely spaced test pits containing most of the assemblage.

3.3 Aboriginal sites and/or deposits

Table 3.1 presents a summary of the Aboriginal objects and places identified within the project area. These are presented in Plates 3.1-3.4 inclusive and Figure 3.1.

Table 3.1 Aboriginal objects, sites and places documented within the project area.

AHIMS #	Site name	Site type	Archaeological significance	Description
-	NEC AS1	Artefact scatter	Moderate	A higher density stone artefact scatter recovering up >20/m^2 found in the northeastern/eastern portion of the project area.
-	NEC BS1	Background scatter	Low	A low-density background scatter found of <5/m^2 found across the project area.

Plate 3.1 The soil profile encountered within the project area. Artefacts were generally found ~40-80cm below surface.

Plate 3.2 The soil profile encountered within the project area. Artefacts were generally found ~40-80cm below surface.

Plate 3.3 An example of a core artefact recovered at NES AS 1. Scale = 1 cm

Plate 3.4 An example of a conjoin artefact recovered from NES AS 1. Scale = 1 cm

3.4 Potential impacts

The project design will adversely affect one artefact scatter site and one background scatter site (Table 3.2, Figure 3.2).

Table 3.2 Summary of potential impacts to Aboriginal sites and objects.

AHIMS ID	Site name	Proposed activity causing harm	Degree of harm
-	NEC AS 1	Multi-purpose facility, new sports court, gymnasium	Partial loss of value
-	NEC BS 1	All proposed development activities	Partial loss of value

KEY

- Newcastle High School
- Where ACHMP applies
- Test pit

Archaeological resource

- NEC BS1
- NEC AS1

Source: EMM (2023); DFSI (2021); Metromap (2023)

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Existing archaeological resource for the project area

Newcastle Education Precinct
Aboriginal Cultural Heritage Management Plan
Figure 3.1

EMM creating opportunities

KEY

- Newcastle High School
- Where ACHMP applies
- Test pit
- Site layout

Archaeological resource

- NEC AS1
- NEC BS1

Source: EMM (2023); DFSI (2021); Metromap (2023)

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Project impacts to identified Aboriginal heritage

Newcastle Education Precinct
Aboriginal Cultural Heritage Management Plan
Figure 3.2

EMM creating opportunities

4 Mitigation and management

4.1 At a glance

- One project specific mitigation measure is required **prior to the construction phase**:
  - Archaeological excavations across NEC AS 1 in the north eastern/eastern corner of the project area to be implemented, as presented in Figure 4.1 and methods outlined in Section 4.2.1 and Appendix D.
- A number of ongoing general post-approval heritage requirements are required **during construction and initial operational phases**. These are outlined in detail in this section and include the need to implement suitable cultural heritage inductions for all on-site personnel, protocols in the event that unexpected cultural materials are found; and processes in the event that areas outside the approved project area require development activities.

4.2 Project specific requirements

The ACHA identified a number of Aboriginal sites and deposits that would be adversely affected by the proposed activity. As such, a range of mitigation requirements are proposed to offset these impacts (Figure 4.1). This section outlines the specific activities and timing of these requirements.

4.2.1 Artefact collection

N/A

4.2.2 Archaeological excavation

The NEC AS 1, located in the north eastern corner of the project area, has evidence of cultural deposits (Section 3; Figure 3.1). These deposits were found in test pits 5 and 6(offset) and suggested further cultural materials may be present elsewhere in this part of the site – much of which was inaccessible during the assessment phase due to ongoing school operations. Additional archaeological excavations are required to further characterise, and if required salvage (preservation in record), any cultural materials across this zone.

Figure 4.1 presents the proposed locations of additional investigative archaeological excavations required during the project. The additional test pits have been designed to supplement the archaeological program undertaken during the ACHA, and where construction is newly proposed. Salvage excavations focussing on one or several of this initial test pit location would be dependent on cultural thresholds being met.

The excavations would adopt the methods and requirements outlined in Appendix D, with the following modifications:

- Additional research questions to be considered:
  - Currently the assemblage appears of Holocene (<5,000 years ago) age, while the soil profile appears to date to >13,000 years ago. Can further understanding of the chronology of the cultural assemblage and the soil profile be determined through additional investigations and/or sampling?
  - Can further relationships between the cultural assemblage at NES AS 1 and the broader Newcastle estuary be determined? Is the cultural assemblage being recovered from local sources or suggest a wider movement across the locale?
- In addition to the standard excavation techniques outlined in Appendix D, the following requirements should be met:
  - Geotechnical information indicates that there is significant modern fill and overburden deposits several metres in depth fringing the identified curtilage of NES AS 1, and especially along the

northeastern edge of the project area. Where such fill units are encountered and discerned during the investigative excavations, these and nearby test pits may be discontinued.

- The archaeological team should consist of four archaeologists and four RAPs (including representatives of the Awabakal LALC, Awabakal Descendants Traditional Owner Aboriginal Corporation, Awabakal and Guringai Pty Ltd and Lower Hunter Aboriginal Inc.) with ancillary support provided by the contractor. Ancillary support should consist of a surveyor to peg out the archaeological excavation locations, site hut/portaloo, access to water, and excavator for backfilling (as required).

Once the archaeological excavations have been completed to the satisfaction of the heritage consultant in discussion with the RAPs, the construction works in this area may progress. A notification of the completion of these works should be provided to all key stakeholders (Table 1.2).

Post excavation analysis and reporting should be undertaken in accordance with Appendix D and build upon the results of the ACHA. The reporting can be developed in parallel with the construction and is not required before the development activities resume. Once developed, the report should be provided to the RAPs for comment in accordance with Section 2.3. Once finalised, the report should be submitted to Heritage NSW's AHIMS database as outlined in Appendix B.

EMM in February 2024 has completed the on-site works in accordance to the methodology above. Post excavation analysis and reporting is ongoing at the timing of writing this document.

4.2.3 Cultural monitoring

N/A

4.2.4 Timing

Typically, archaeological mitigations are best undertaken during pre-construction prior to any construction activities that may affect surface and/or shallowly buried cultural materials. However, for this project, many of the activities will have to be undertaken during construction, since exposure of the soil profile will not occur until certain parts of the site are excavated and/or removed. Specifically, the following timing must be adopted:

- Pre-construction
  - Archaeological excavation as outlined in Section 4.2 should be undertaken before the main construction program begins and/or prior to any nearby ground disturbance activities during the construction phase.
- Construction
  - N/A

KEY

- Newcastle High School
- Proposed test pit
- Test pit
- NEC AS1
- NEC BS1

Archaeological resource

Source: EMM (2022); DFSI (2021); Metromap (2022)

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GDA2020 MGA Zone 56

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Newcastle Education Precinct
Aboriginal Cultural Heritage Assessment
Figure 4.1

EMM creating opportunities

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4.3 General requirements

The following sections outline a range of general cultural heritage process and procedures that must be implemented during the construction phase of the project (Figure 4.1).

4.3.1 Cultural heritage inductions

All employees, contractors, sub-contractors involved in ground-disturbing activities will undergo an Aboriginal cultural heritage induction. For key project team members, this will be conducted by a representative of the RAPs prior to any ground-disturbance.

Depending on the required frequency, subsequent inductions may be undertaken by the lead contractor using documentary details sought from, and provided by, the RAPs. In this situation, periodic involvement of the RAPs to ensure the quality and relevance of cultural inductions is being maintained must be undertaken through the project construction phase.

The cultural heritage induction/relevant sub-component of the site induction will be planned in consultation with RAPs. The proponent will seek input from RAPs regarding appropriate materials for input and key issues that RAPs would like raised to all inductees. The following points will be conveyed through site induction material:

- Aboriginal sites and places have been identified across the region
- Aboriginal sites and places are of significance to the Aboriginal community, are important to the wider community and must be treated with respect
- Aboriginal sites are protected by law and that project approval includes conditions allowing impacts to certain specified Aboriginal sites in accordance with this ACHMP (see Appendix B)
- Aboriginal sites have included isolated stone artefacts and stone artefact scatters
- Aboriginal sites can be hard to recognise, but a range of photographs giving examples should be provided to inductees to show the types of material that may be expected
- that there are unexpected finds procedures which involve stopping work if suspected cultural materials or skeletal material/human remains is identified on-site.

In addition, visitors to the project and general contractors not involved in ground-disturbing activities will be made aware of their obligation to avoid harm to cultural heritage through a cultural heritage component of the general site induction. Records of these inductions will be kept by the lead contractor.

4.3.2 Unexpected finds protocols

i Discovery of Aboriginal artefactual materials

Table 4.1 sets out the measures that will require implementation in the event that any previously unidentified and/or newly observed cultural materials is identified during the pre-construction, construction and/or operational phases of the project. Appendix C provides a description of the types of Aboriginal sites that may be encountered during the project.

The recording of, and any proposed mitigation measures must be completed by a heritage professional(s) with participation the RAPs representative (see Section 2.3). Avoidance of newly identified Aboriginal objects is always the preferred heritage outcome where feasible. Mitigation measures should only be employed when it can be reasonably demonstrated that avoidance is not possible. Heritage NSW must be notified about any plans to move, collect or salvage newly identified sites (Appendix B).

Where avoidance can be achieved, the following management of the cultural materials should be adopted:

- within 20 m of the development footprint, the find will be managed through active protection using suitable fencing (eg star pickets, stakes and wire, bollards, concrete blocks, etc) and appropriate signage (eg 'no access' and/or 'heritage site'). These measures should be established by a heritage professional with the participation of the RAPs; and/or

- over 20 m from the development footprint, no fencing, signage or active land management measures are required for these sites. Suitable recording of the site must be undertaken by a heritage professional and representatives of the RAPs (Appendix B). The site/s must be integrated into the cultural inductions (Section 4.3.1) to ensure all personnel are aware of the location and to avoid inadvertent impacts during the construction.

ii Discovery of skeletal/human remains

In the event that known or suspected human skeletal remains are encountered during the project, the following procedure presented in Table 4.2 must be applied.

Table 4.1 Management of unexpected cultural materials (except skeletal/human remains).

Protocols to follow

- All works within the location of the Aboriginal object/s must stop.
- The person who identified the Aboriginal objects must immediately notify the person in charge of the activity e.g. Project Manager, Foreman, Environmental Representative.
- All construction that could potentially harm the Aboriginal objects or values must cease. Only construction that is required to make the area safe is permissible.
- The Aboriginal object/s is to be protected with the establishment of a no-go zone.
- Contact the project heritage consultant (Section 1.2), Schools Infrastructure NSW Heritage team, and RAPs (see Section 2.3) to lead the subsequent management of the find. Advise Heritage NSW (Table 1.2), and determine their level of involvement in resolving the situation.
- Consideration of avoidance of the cultural materials will be undertaken. Where avoidance **can** be achieved, implement the following:
  - where the find is within 20 m of the development footprint, the find will be managed through active protection using suitable fencing (eg star pickets, stakes and wire, bollards, concrete blocks, etc) and appropriate signage (eg 'no access' and/or 'heritage site'). These measures will be established by a heritage professional with the participation of the RAPs; and/or
  - where the find is over 20 m from the development footprint, no fencing, signage or active land management measures are required for these sites. Suitable recording of the site must be undertaken by a heritage professional and representatives of the RAPs (Table 1.2). The site/s must be integrated into the cultural inductions (Section 4.3.1) to ensure all personnel are aware of the location and to avoid inadvertent impacts during the construction.
- Where avoidance **cannot** be achieved:
  - For isolated Aboriginal object (eg stone artefacts, shell fragments, etc) found in disturbed contexts, the site will be recorded as found (see Appendix B), and subsequently collected by a heritage professional with participation of the RAPs.
  - Where intact cultural deposits are identified with any Aboriginal objects by the heritage professional, additional archaeological excavations will be undertaken prior to any further work in the area. Excavations will include an initial investigative phase to characterise the site, followed by a more extensive salvage excavation where significant cultural material is identified. Excavation methods that can be used as a guide are presented in Appendix D.
- Once the archaeological on-site activities are complete to the satisfaction of the heritage professional in consultation with the RAPs and Heritage NSW, written approval from the Planning Secretary, DPE must be obtained to allow works to resume.
- All archaeological activities should ensure suitable analysis of any cultural materials, chronological, palaeoenvironmental and sedimentological samples collected are suitably analysed and documented in a report that is provided to Heritage NSW (see Appendix B). This should include submission of the identified cultural materials and findings to the Heritage NSW Aboriginal Heritage Information Management System.

Table 4.2 Management of unexpected skeletal/human remains.

Protocols to follow

- All work must **STOP** in the vicinity of the remains. The remains must be left in place and protected from further harm or damage. All construction that could potentially harm the human remains must cease (including stopping all construction within at least 15 m). Only construction that is required to make the area safe is permissible.
- The person who identified the human remains must immediately notify the person in charge of the activity (e.g. Project Manager, Foreman, Environmental Representative).
- The human remains are to be protected with the establishment of a no-go zone.
- If the remains are clearly human, contact NSW Police. If the remains are unclear, initially contact the heritage consultant (Section 1.2) and Schools Infrastructure NSW Heritage team to seek initial advice before proceeding with subsequent steps.
- The person in charge should notify NSW Police of the discovery as soon as possible. All subsequent steps will be dictated by the NSW Police.
  - Police contact: Newcastle police station – T: (02) 4929 0999.
- Contact the project heritage consultant (Section 1.2), Schools Infrastructure NSW Heritage team, and RAPs (see Section 2.3) to brief them on the evolving situation.
- If the NSW Police advise that the human remains are of ancestral Aboriginal origin, and indicate that they will not investigate, the person in charge should contact the project heritage consultant (Section 1.2) and RAPs (see Section 2.3) to lead the subsequent management of the find. Heritage NSW (T: 131 555) should also be notified.
- All future management of the human remains is to be determined by the RAPs. As such, discussion between the RAPs, project heritage consultant, the proponent and contractor should be organised as soon as possible. Once an agreement on the subsequent management of the find is undertaken, Heritage NSW should be advised of the proposed course of action to be implemented.
- Discussions should include consideration and resolution of the following:
  - If needed - further investigation to understand the extent, distribution and characteristics of the human remains. Where required, the heritage professional in close consultation with the RAPs, and participation of a physical anthropologist, should establish the investigation area and define protocols and excavation methods to be adhered to during such investigation.
  - Avoidance and/or project redesign to ensure the human remains can be left unaffected by the works.
  - Where avoidance cannot be achieved, the suitable recovery and relocation of the human remains. Where required, the heritage professional in close consultation with the RAPs, and participation of a physical anthropologist, should establish the investigation area and define protocols and excavation methods to recover and move the remains.
  - Whether scientific research is desired by the RAPs to provide further context of the remains (e.g. age of individual, how they died, gender, time of burial, etc).
  - If relocation is determined, identify a suitable re-burial location, and ensure the necessary discussions and agreements are in place for the re-burial to occur. Where the RAPs permit, a temporary storage location may be considered while the final location is resolved.
- Once the on-site activities associated with the human remain are complete to the satisfaction of the heritage professional in consultation with the RAPs, construction activities may continue.
- Once the agreed management activities are implemented and completed, ensure suitable analysis (as required) of the remains, and formal reporting is developed to be provided to Heritage NSW (Appendix B).

4.3.3 Changing heritage professional

Where the heritage consultant changes through the project, suitable hand over will be undertaken to minimise loss or mistranslation of the intent of the information, findings and future steps in relation to Aboriginal heritage.

Any handover would include the proponent's facilitation of:

- a face-to-face/online meeting between the heritage consultants to discuss the project requirements, key issues, community commitments, and expectations
- ensure data and mapping in useable formats are provided by the incumbent heritage consultant.

Once undertaken, the change of heritage consultant should be advised to the Aboriginal parties outlined in Table 1.2.

4.4 Management of recovered cultural materials

All recovered cultural material should be curated:

- At the heritage consultant's office for archaeological analysis. The assemblage will be stored in a locked cabinet.
- Once analysis has been completed, the assemblage will be provided to the school for use in on-site interpretation and education opportunities.

4.5 Any proposed activity outside approved project area

Any activity that may cause ground disturbance outside of the approved project area (Figure 1.1), or outside other existing approved areas under the development consent, will not occur without prior Aboriginal heritage assessment and other relevant legislative and internal approvals sought as required.

Depending on the scope, nature and approval pathway of the proposed ground disturbance, the following may apply:

- if the proposed activity requires additional environmental assessment, such as a modification to the existing development consent, an Aboriginal heritage assessment will be completed in accordance with relevant assessment requirements as specified by Heritage NSW/DPE;
- if the proposed activity is permissible under the existing SSIA (i.e. an Aboriginal heritage impact permit (AHIP) not required), an Aboriginal heritage assessment must initially be completed to a level consistent with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010b) guidelines. Any potential impacts to known or newly identified Aboriginal objects will be managed in accordance with the unexpected finds procedures set out in Section 4.4; and/or
- if the proposed activity requires a separate approval pathway not permissible as part of the existing SSIA, then an Aboriginal heritage assessment must initially be completed to a level consistent with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010b) guidelines. Depending on the outcomes of the due diligence assessment, further investigation may be required in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (DECCW 2010c) and/or other relevant guidelines. If Aboriginal objects are likely to be impacted, further approvals under the National Parks and Wildlife Act 1974 and/or Environmental Planning and Assessment Act 1979 as required may be required prior to work being permissible.

5 Compliance, review and improvement

5.1 At a glance

- This section provides information to ensure the ACHMP is complied with during the project, and processes and procedures to manage complaints and non-conformances. A complaints register for use is provided in Appendix E.
- Criteria and timing for revisiting and updating the ACHMP is provided in this section. A document control and revision table is provided in Appendix F.

5.2 Compliance and auditing

5.2.1 Measuring performance

Compliance with the ACHMP will be measured by standard environmental auditing procedures undertaken at regular intervals for the project. The audit will include an assessment of compliance with SSDA conditions and will include auditing the following measures:

- protection of all nominated sites;
- inductions are taking place and include appropriate material; and
- reporting and managing any unexpected finds in accordance with this ACHMP.

The contractor may engage a heritage consultant to assist with reporting compliance as part of an Independent Environmental Audit.

Any incidents and non-compliance notifications will follow requirements set out in SSDA and as per the broader Environmental Management System (EMS).

5.2.2 Complaints

Any complaints can be made to the key stakeholders identified in Table 1.2, and will be documented in a 'complaints register' included in Appendix E.

Any complaints will be used in improvements of the ACHMP as outlined in Section 5.3.

5.2.3 Non-conformance

Any non-conformance will be subject to a detailed investigation by the proponent and heritage consultant in consultation with the RAPs. The investigation will include:

- a clear description of the non-conformance, and its actual/potential harm to cultural materials
- all personnel involved in the non-conformity, their organisation and contact details
- any corrective actions undertaken to address the non-conformity
- next steps, including the need for additional heritage activities and/or requirements to contact DPE/Heritage NSW to advise them of the non-conformity.

Any non-conformance will be used in improvement of the ACHMP as outlined in Section 5.3.

5.3 Review and improvement

5.3.1 Continual improvement

Continual improvement of this ACHMP will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. The continual improvement process will be designed to:

- identify areas of opportunity for improvement of environmental management which leads to improved environmental performance
- determine the root cause or causes of non-conformances and deficiencies
- develop and implement a plan of corrective and preventative action to address non-conformances and deficiencies
- verify the effectiveness of the corrective and preventative actions
- document any changes in procedures resulting from process improvement.

5.3.2 ACHMP review and update

The ACHMP will be revisited and updated in the following circumstances:

- every six months from initial finalisation until the completion of ground disturbance activities
- where proposed activities are required outside of approved areas as defined under the SSDA
- where modification to the SSIA occurs that may affect impacts to Aboriginal heritage
- where complaints and/or non-conformances have been identified that require changes to ensure suitable management of Aboriginal heritage in future stages of the project
- where approved changes to the project change or remove previously planned impacts on Aboriginal heritage where mitigation was proposed in the ACHMP but is no longer required
- where other conditions or situations arise that require the updating of this plan.

Any changes to the ACHMP will be included in the document control table provided in Appendix F. Aboriginal consultation for any updates and/or changes will be undertaken in accordance with Section2.3.

References

EMM Consulting Pty Limited, 2023, Newcastle Education Precinct. Aboriginal Cultural Heritage Assessment. Unpublished report to Schools Infrastructure NSW

Abbreviations

Abbreviation	Full term
ACHA/ACHAR	Aboriginal cultural heritage assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ACHMP	Aboriginal cultural heritage management plan
ACHMSP	Aboriginal cultural heritage management sub-plan. Typically an alternate name to ACHMP
CoA	Conditions of Approval
EA	Environmental Assessment
EMM	EMM Consulting Pty Limited
DEC/DECCW	A former NSW government body, now Heritage NSW
DPE	NSW Department of Planning and Environment
IPC	Independent Planning Commission
LALC	Local Aboriginal Land Council
LGA	Local government area
RAP	Registered Aboriginal Party (for the project)
RTS	Response to submissions
SSD	State Significant Development
SSI	State Significant Infrastructure
SSDA	State Significant Development approval, also called Project Approval
SSIA	State Significant Infrastructure approval, also called Project Approval

Appendix A
Aboriginal consultation

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A.1 Consultation log

A log of all consultation undertaken with the RAPs is provided in the next page.

Table A.1 Consultation log

Date	Incoming/Outgoing	External Organisation	Contact made by (internal organisation)	Contact received from (external organisation)	Method	Details of communication
9/8.23	Outgoing	Awabakal LALC, Awabakal Descendants Aboriginal Corporation, Awabakal & Guringai, Lower Hunter Aboriginal Inc	Alan Williams, Georgia Burnett	-	Meeting	Undertook a meeting to discuss the proposed contents of the ACHMP and the archaeological excavation program for the northeastern/eastern portion of the Project area. Meeting minutes are included that provide further information.
15/11/23	Outgoing	All registered Aboriginal parties	EMM	-	Email	Distribution of a project update advising of the imminent project approval and timeframes for finalising the ACHMP and implementing any works from it.
12/2/24 – 15/2/24	Outgoing	Awabakal LALC, Awabakal Descendants Aboriginal Corporation, Awabakal & Guringai, Lower Hunter Aboriginal Inc	EMM	-	Email	Implementation of salvage works as per Section 4.4.2.

Table A.1 Consultation log

Date	Incoming/Outgoing	External Organisation	Contact made by (internal organisation)	Contact received from (external organisation)	Method	Details of communication

Table A.1 Consultation log

Date	Incoming/Outgoing	External Organisation	Contact made by (internal organisation)	Contact received from (external organisation)	Method	Details of communication

Table A.1 Consultation log

Date	Incoming/Outgoing	External Organisation	Contact made by (internal organisation)	Contact received from (external organisation)	Method	Details of communication

A.2 Aboriginal feedback

The following section includes any feedback received during the finalisation and/or update of this ACHMP.

Alan Williams

From: Georgia Burnett
Sent: Tuesday, 19 December 2023 10:37 AM
Cc: Alan Williams
Subject: Newcastle Education Precinct - Meeting minutes - Wednesday 9 August 2023

Hi all,

Apologies for the delay in distributing these minutes, there was some delay with the project team and we just realized these were never circulated more broadly. If you remember, we held a meeting to discuss the ACHMP for the Newcastle Education Precinct project back in August, please find below some of the key points that were raised and discussed.

Please let me know if we have omitted or forgotten anything, happy to correct where inaccurate.

Meeting to discuss proposed Aboriginal Cultural Heritage Management Plan (9 August, Newcastle High School, Hamilton South)

Attendees: Alan Williams and Georgia Burnett (EMM), Anthony Harrigton (APP), Matt Syron (Awabakal Local Aboriginal Land Council), Peter Leven (Awabakal Descendants Traditional Owners Aboriginal Corporation), Tyler Howie (Awabakal & Guringai Pty Ltd), David Ahoy (Lower Hunter Aboriginal Incorporated)

Key points and actions:

- AW provided a detailed summary of the works to-date for the proposed Newcastle Education Precinct and proposed Aboriginal Cultural Heritage Management Plan (ACHMP) recommendations, including:
    - Summary of the findings and recommendations of the Newcastle Education Precinct Aboriginal Cultural Heritage Assessment (ACHA), as distributed in the final report in March 2023.
    - Update regarding the OSL dating, as the results having been received after the distribution of the draft report. The dates suggest a very old landscape (11-17ka), re-jigged around or just after the LGM; however, given the characteristics of the assemblage, it is doubtful that the artefacts are of that age, and probably reflect bioturbation downwards through the soil profile. Further investigation of this matter is proposed as part of the ACHMP activities.
    - Provision of map and details of proposed further excavation within NEC AS1 as part of the ACHMP requirements.
    - Some discussion of timing, which remains uncertain while the project is under assessment by Department of Planning and Environment, but probably in very late 2023 or early 2024.

Discussions and outcomes included:

- Discussions around the proposed test excavations, with three key amendments sought and/or determined through the meeting and on-site investigation:

1. Ensuring suitable threshold triggers for the implementation of any required salvage excavations, and ensure these are in line with broader Heritage NSW requirements in locally issued Aboriginal Heritage Impact Permits. (We provide the proposed threshold triggers from the ACHMP below as currently proposed, but happy to explore amendments).
2. All 1m^2 test pits are dug in quads (i.e. 4 x 0.25m^2 test pits) to provide further information to inform the direction of any salvage excavations if required, and which would be less clear where 1m^2 test pits were undertaken without division. This approach will be added to the ACHMP.
3. It was noted that some parts of the northeast corner where NEC AS1 is proposed for further works may have substantial fill or overburden deposits from nearby canal works. As such, mechanisms to enable the removal of this fill via mechanical means and/or discontinuance of some of the proposed test pits are to be included in the ACHMP to provide flexibility of management in these areas.

- There was strong support for some form of interpretation and/or education opportunity to be included in the new school based on the archaeological works undertaken and proposed. This included the retention of any recovered artefacts in a display cabinets or equivalent with suitable signage. AH was supportive of this, and would take this idea back to the broader project team for discussion and integration where feasible.

Proposed thresholds for expansion:

The thresholds for expansion would include:

- *Stone artefact densities greater than 20/m^2 and therefore indicative of past occupation based on our broader understanding of the region.*
- *Where evidence of multiple phases of past activity is identified through changing raw material types and/or distinct technological attributes at different depths within the soil profile.*
- *Where dense concentrations of cultural materials are discovered at significant depths that may indicate extreme age.*
- *Where rare or unique stone artefacts and/or other archaeological material is recovered.*
- *Where unique and/or rare archaeological features (eg hearths, cooking pits, etc) are identified.*
- *Other conditions that are considered by the Excavation Director to inform the research questions and/or broader aims of the project.*

Happy to discuss.

Georgia Burnett
Senior Archaeologist
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From: Alan Williams
To: Alan Williams
Cc: Georgia Burnett
Subject: Newcastle Education Campus - ACH - project update - December 2023
Date: Tuesday, 19 December 2023 10:28:41 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.jpg
image006.png

Hi All,

This is just a brief email to let you know that the project approval for the Newcastle Education Campus, 25a National Park Street, Newcastle West, is expected in the coming days – potentially prior to Christmas. The conditions for this project are expected to align with the recommendations in EMM's Aboriginal cultural heritage assessment (can be found here), and which recommends the development of a management plan to provide direction on post-approval archaeological mitigation activities. The focus of these activities is further archaeological excavation in the northeastern/eastern corner of the site where cultural materials were previously encountered, as well as cultural inductions and unexpected find protocols, etc.

At this stage, we are aiming for the management plan to be distributed early in the new year for your review, inputs and comments, with any on-site works likely beginning in late January 2024 (probably the 29th). There are still a few steps for this to happen, but just wanted to keep you informed since I know many will be taking leave over the Christmas break and may not be back much before this date.

Happy to discuss
Thanks
A

Dr Alan Williams FSA FRSA FRSN MAACAI MAIATSIS MEIANZ
Technical Lead, Aboriginal Heritage|Associate Director

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School of Biological, Earth and Environmental Sciences
University of New South Wales,
Sydney, NSW 2052

Industry Fellow
Institute of Sustainable Futures
University Technology Sydney
Ultimo, NSW 2007

I work flexibly. I'm sending you this message now because it's a good time for me, but do not expect you to read, respond or action it outside your regular hours

From: Amber Morgan
To: Amber Morgan
Cc: Joel Mason; Rohani Dutch; Samuel Elias
Subject: Re: Newcastle Education Campus - ACHMP excavations Invitation
Date: Friday, 9 February 2024 12:22:30 PM
Attachments: Outlook-A picture .png
Outlook-https___do.png
Outlook-A picture .png

Hi all,

This is just a reminder for the upcoming excavations at Newcastle High School commencing next week (12th - 16th Feb).

The team will be meeting at the front office of Newcastle High School (160/200 Parkway Avenue, Hamilton South) at **8am** on Monday morning.

The field team will be lead by Joel Mason (04 0608 2179) with assistance from Rohani (0459 353 013) and Samuel (0431 029 429). If you have any issues please don't hesitate to call one of them.

Thank you and kind regards,

Amber Morgan
Graduate Archaeologist

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M 0417 876 189
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From: Amber Morgan <amorgan@emmconsulting.com.au>
Sent: Friday, 2 February 2024 10:04 AM
To: Amber Morgan <amorgan@emmconsulting.com.au>
Cc: Georgia Burnett <gburnett@emmconsulting.com.au>; Joel Mason <jmason@emmconsulting.com.au>; Alan Williams <awilliams@emmconsulting.com.au>; Laressa Barry <lbarry@emmconsulting.com.au>
Subject: Re: Newcastle Education Campus - ACHMP excavations Invitation

Hi All,

Apologies again for having to postpone the fieldwork for this week but we can now confirm new dates.

Fieldwork will be commencing on **Monday 12th February.**

We are seeking one sites officer from your organisation for up to 5 days between 12th - 16th February 2024. Please let us know if you can still attend.

All the information you may need can be found in the invitation email, attached below, but if you have any questions please reach out.

We will be meeting at the front office of Newcastle High School (160/200 Parkway Avenue, Hamilton South) at **8am** on Monday morning.

Kind regards,

Amber Morgan
Graduate Archaeologist

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From: Amber Morgan <amorgan@emmconsulting.com.au>
Sent: Thursday, 25 January 2024 4:55 PM
To: Amber Morgan <amorgan@emmconsulting.com.au>
Cc: Georgia Burnett <gburnett@emmconsulting.com.au>; Joel Mason <jmason@emmconsulting.com.au>; Alan Williams <awilliams@emmconsulting.com.au>
Subject: Re: Newcastle Education Campus - ACHMP excavations Invitation

Hi All,

Sorry for the late notice but we have had to cancel the for fieldwork next week.

Apologies for any inconvenience this has caused but we will let you know as soon as possible when new dates have been organised.

Kind regards,

Amber Morgan
Graduate Archaeologist | Ecology & Heritage

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From: Amber Morgan
Sent: Monday, January 15, 2024 1:50:24 PM
To: reception@awabakallalc.com.au <reception@awabakallalc.com.au>; lowerhunterai@gmail.com <lowerhunterai@gmail.com>; tracey@guringai.com.au <tracey@guringai.com.au>; awabakal.to@gmail.com <awabakal.to@gmail.com>
Cc: Georgia Burnett <gburnett@emmconsulting.com.au>; Joel Mason <jmason@emmconsulting.com.au>; Alan Williams <awilliams@emmconsulting.com.au>
Subject: Newcastle Education Campus - ACHMP excavations Invitation

Dear all,

Thank you for your ongoing involvement to date in the Aboriginal heritage assessment for the proposed redevelopment of the Newcastle Education Campus. As you will know, the ACHMP for this project was distributed in Dec 23 for your review, and included some further investigation within the sandy deposits (NEC AS1) in the northeastern/eastern corner of the site; as noted in that communication, we are looking to implement the plan fairly shortly after the comment period closes and as such, we would like to invite your group to participate in the excavations scheduled for **Monday 29 January 2024.** This email details

the upcoming excavations and what we need from you.

Please find below some of the logistics for the fieldwork:

1. We are seeking one sites officer from your organisation for 5 days between **Monday 29 January and Friday 2 February 2024.**
2. Initial meeting place – front of Newcastle High School (160/200 Parkway Avenue, Hamilton South) as we will need to check in with the school office, time TBC but likely 7am or 8am.
3. These works are being undertaken by Joel Mason (0406 082 179) and assisted by Amber Morgan (0417876189).
4. Alan Williams will be your main contact for any broader project issues – 0438 104 740.

Insurances and contracts

Appropriate insurance coverage (workers compensation, public liability insurance) must be provided by all applicants prior to fieldwork. Even if you have provided this previously to EMM for other projects, we will need new contracts and updated insurances for auditing purposes. If your organisation does not require these insurances, please provide a written statement from WorkCover or your insurance provider acknowledging your insurance status and the reasons why this occurs. If you do not have these documents and are unable to obtain them, please let us know and we can help arrange a solution via a third party provider.

Prior to the commencement of fieldwork, please ensure we have received your:

- Signed conditions of engagement form (attached);
- Your organisation's workers compensation, personal accident insurance (or equivalent);
- Public liability; and,
- Professional indemnity (not required but desirable).

If we do not receive them, I am afraid your involvement in that phase of fieldwork will be discontinued until resolved.

Requirements and details (work scope)

We are seeking one sites officer from your organisation for up to 5 days between 29 January - 2 February 2024. Please note that there is potential for the program to run shorter due to the findings. The works will include the assistance in the archaeological excavation program, including manual digging, moving of buckets, sieving, manual labour, and work with EMM archaeologists to document them for our reporting requirements.

We are authorised to pay up to **$130 ex GST per hour** for this representative for a period of up to 8 hours per day of attendance. Please provide an invoice to Alan Williams at EMM with the title 'Newcastle Education Campus ACHMP excavations' and we will submit it for processing. Typically, we pay within three weeks of receipt of invoice but payments can take up to 60 days to run through our system. Invoices require the following: your registered business name, address, and ABN; GST breakdown if relevant; details of the persons and dates involved; and, electronic banking details.

Please note:

- If you are unwell and/or unable to attend site, please let EMM know the night before or before 7am in the morning on the day to discuss.
- Please ensure your sites officer has all necessary safety gear (steel toecaps, hi-vis, long sleeves/pants, rain jacket, sun hat, safety glasses/sunglasses) for a day in the field. Please bring wet weather gear in case we do get some rain while on site.
- Please bring lots of food and water for yourself for the day.

Code of Conduct

Professional code of conduct is expected at all times from all participants. Harassment or other inappropriate behaviour is not acceptable. Common courtesy towards all team members and in particular, to those providing site access, is expected.

Any person who behaves in a manner that is abusive, threatening or humiliating towards other members of the field team or other parties (eg school staff) will be asked to leave immediately. While your organisation may continue to be invited to participate, the individual in question would not be permitted to attend for the remainder of the field program. This will be further emphasised in our on site safety documentation.

Happy to discuss.

Thank you,

Amber

Amber Morgan
Graduate Archaeologist | Ecology and Heritage
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Climate Active Carbon Neutral ORGANISATION

Appendix B
Legislation and obligations

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B.1 Obligation to protect Aboriginal cultural heritage

B.1.1 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) provides protection for Aboriginal objects and places across NSW:

- An Aboriginal object is defined as: *Any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains.*
- An Aboriginal place is: *any place declared to be an Aboriginal place under section 84*. This is a very specific piece of legislation that provides process and management of Aboriginal sites of cultural, but not necessarily scientific, values. They are commonly, but not always associated with intangible values.
- any place declared to be an Aboriginal place by the Minister for the Environment, under Section 84 of the Act.

B.1.2 Obligation to avoid harm

All employees, contractors, sub-contractors and visitors to the project have an obligation to avoid harming Aboriginal heritage unless engaged in an Aboriginal heritage management activity described in this plan.

The National Parks and Wildlife Act 1974 defines “harm” to an object or place as any act or omission that:

a) destroys, defaces or damages the object or place; or

b) in relation to an object-moves the object from the land on which it had been situated; or

c) is specified by the regulations; or

d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c), but does not include any act or omission that:

e) desecrates the object or place; or

f) is trivial or negligible; or

g) is excluded from this definition by the regulations.

B.1.3 Obligation to protect and implement management measures

Site personnel, contractors and subcontractors responsible for land management or construction have an obligation to protect Aboriginal heritage within their area or work responsibility. This extends to both cultural materials identified as part of earlier phases of the project, and any additional cultural materials identified during the construction. Protection means active recognition of known Aboriginal heritage and active measure to avoid and/or suitably mitigate Aboriginal heritage.

This may include fencing, erosion control and modification of work plans to avoid impacts to Aboriginal heritage, as well as facilitating a process where work personnel are aware of the nearby heritage.

Site personnel, contractors and subcontractors also have the responsibility to ensure that appropriate management measures have been employed prior to, or in association with, their activities which impact Aboriginal sites.

B.1.4 Statutory reporting requirements

Notifications to Heritage NSW are required in relation to discovery, impact and care of Aboriginal objects under the NPW Act. This will be the responsibility of the project manager, environmental representative and/or equivalent.

B.1.5 Discovery of Aboriginal objects

Under Section 89A of the NPW Act, it is a requirement that Heritage NSW is notified of the existence of Aboriginal objects as soon as practicable after they are first identified. This is done through the completion of the Heritage NSW Aboriginal Site Card which is submitted to the Registrar of AHIMS for inclusion on the Aboriginal site database. Information regarding AHIMS and site recording forms can be downloaded from Heritage NSW's website: http://www.environment.nsw.gov.au/licences/DECCAHIMSSiteRecordingForm.htm.

B.1.6 Care agreements

Under s85A of the NPW Act, Aboriginal objects remain the property, and under the protection of, the Crown until formal transfer to a person or persons of a class prescribed by the regulations occurs. A Care Agreement is not currently proposed under this plan; however, may be pursued in the future if Aboriginal objects are identified to a level of significance that the RAPs wish to retain such objects.

Care Agreement application forms can be downloaded at:

https://www.environment.nsw.gov.au/topics/aboriginal-cultural-heritage/protect-and-manage/care-agreements.

B.1.7 Reporting impact to Aboriginal sites

An Aboriginal Site Impact Recording Form must be completed following impacts to AHIMS sites that are:

- a result of test excavation carried out in accordance with the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW
- authorised by an Aboriginal Heritage Impact Permit (AHIP) issued by Heritage NSW
- undertaken for the purpose of complying with Secretary's environmental assessment requirements issued by DPE for:
    - state significant development (SSD);
    - state significant infrastructure (SSI); or
    - a major project; or
    - authorised by an SSD/SSI approval under the EP&A Act.

Completed forms must be submitted to the AHIMS Registrar at ahims@environment.nsw.gov.au.

Aboriginal Site Impact Recording Forms can be downloaded at:

https://www.environment.nsw.gov.au/resources/cultureheritage/aboriginal-site-impact-recording-form-120558.pdf

Appendix C
Aboriginal site descriptions

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C.1 Site definitions

A description of terms used to describe different site features known to occur in the vicinity of the project area is provided in Table C.1 and use definitions provided by Heritage NSW.

Table C.1 Site definitions and recording

Site feature	Definition and recording methods
Aboriginal ceremony and Dreaming	Previously referred to as mythological sites these are spiritual/story places where no physical evidence of previous use of the place may occur; e.g. natural unmodified landscape features, ceremonial or spiritual areas, men's/women's sites, dreaming (creation) tracks, marriage places etc.
Artefact site (open stone artefact site)	Objects such as stone tools, and associated flaked material, spears, manuports, grindstones, discarded stone flakes, modified glass or shell demonstrating evidence of use of the area by Aboriginal people.
Burials	A traditional or contemporary (post-contact) burial of an Aboriginal person, which may occur outside designated cemeteries and may not be marked; e.g. in caves, marked by stone cairns, in sand areas, along creek banks etc.
Fish trap	A modified area on watercourses where fish were trapped for short-term storage and gathering.
Grinding grooves	Grinding grooves are defined as an area of outcropping bedrock containing evidence of one or more grinding grooves where ground-stone hatchets or other grinding practices (i.e. seed grinding) were implemented.
Habitation structure	Structures constructed by Aboriginal people for short- or long-term shelter. More temporary structures are commonly preserved away from the NSW coastline, may include historic camps of contemporary significance. Smaller structures may make use of natural materials such as branches, logs and bark sheets or manufactured materials such as corrugated iron to form shelters. Archaeological remains of a former structure such as chimney/fireplace, raised earth building platform, excavated pits, rubble mounds etc.
Modified tree (carved or scarred)	Trees which show the marks of modification as a result of cutting of bark from the trunk for use in the production of shields, canoes, boomerangs, burials shrouds, for medicinal purposes, foot holds etc., or alternately intentional carving of the heartwood of the tree to form a permanent marker to indicate ceremonial use/significance of a nearby area, again these carvings may also act as territorial or burial markers.
Potential archaeological deposit (PAD)	An area where Aboriginal objects may occur below the ground surface. The term 'potential archaeological deposit' was first applied in Sydney regional archaeology in the 1980s and referred to rockshelters that were large enough and contained enough accumulated deposit to allow archaeologists to predict that subsurface cultural material was likely to be present. Since then, the term has come to include open sites where the same prediction can be made. Unless previously identified, it is considered unlikely that a PAD would be classified through an unexpected finds process.
Shell	An accumulation or deposit of shellfish from beach, estuarine, lacustrine or riverine species resulting from Aboriginal gathering or consumption. Usually found in deposits previously referred to as shell middens. Must be found in association with other objects like stone tools, fish bones, charcoal, fireplaces/hearths, and burials. Will vary greatly in size and composition.

Table C.1 Site definitions and recording

Site feature	Definition and recording methods
Stone quarry	Usually, a source of good quality stone which is quarried and used for the production of stone tools. Stone quarries represent where Aboriginal people gathered raw stone materials for stone tools and/or manufactured stone tools from the adjacent source material. Quarry sites are found at rock outcrops where the material was of suitable quality to have been used to manufacture stone tools. Stone quarries were defined by the presence of outcropping stone material with nearby evidence of the same material type used in the stone tool manufacture process. This was most commonly indicated by large stone cores or stone flakes distributed amongst the same naturally outcropping material.

Appendix D
Archaeological excavation methods

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D.1 Excavation methods

The following section outlines a standard excavation methodology that can be adopted in the case of additional required archaeological excavations (Section 4.2.2) and any unexpected finds procedures (Section 4.3.3). This approach should be used a default, with alternate methods considered by the heritage professional in consultation with the RAPs on a case-by-case basis.

The specific methods below propose a two-stage approach, reflecting initially an investigative phase followed by subsequent conservation ex situ or archaeological salvage where certain thresholds are met.

D.1.1 Generic research questions

- What is the spatial and stratigraphic patterns of cultural materials within the investigation area? Can inter and/or intra-site past Aboriginal activities be determined through excavation in these areas?
- What is the age, composition, technological attributes, and significance of cultural materials within the areas of the proposed activity?
- What are the environmental characteristics associated with the distribution of Aboriginal cultural heritage within the area? Can the formative processes of the stratigraphic profile provide information on the nature and/or survivability of the archaeological resources? Are there other key factors in the distribution and extent of the material culture within the area?
- What are the cultural, social and public values associated with the cultural materials in the area? Does the excavations support or require modification of the significance and values previously assigned to Aboriginal sites, places and/or locales within the project area?
- How will the cultural materials be conserved and managed in future?

D.1.2 Investigative phase

The following methods will be adopted to investigate the cultural materials.

- Excavation
  - A grid of 1 m^2 test pits would be established at suitable spacing (<20 m) to inform the identified cultural materials using a hand-held Leica RTK CS10/GS08 survey grade Differential GPS device (or equivalent).
  - All test pits would be dug manually using shovels, mattocks, trowels and other hand tools as required Excavation would be undertaken as 1 m^2 units. Each square would be given an alpha-numeric label for identification purposes.
  - All excavation would be undertaken in 10 cm spits to culturally sterile depths or 1.5 m below current surface (the deepest depth that can be reached without shoring systems and/or benching).
  - All sediment would be placed in buckets, labelled according to its assigned test pit number and spit, and recorded and documented. All sediment would then be wet-sieved through a 5 mm wire aperture mesh, and any historic and/or Aboriginal cultural material recovered, labelled and bagged for subsequent analysis and curation.

- Field Documentation

  - All test pits would be documented using photographic records, written descriptions and scaled drawings.

  - Soil profiles would be recorded in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010), including scaled drawings, photographs, and written descriptions.

  - Soil samples may be collected for description, sedimentological and chronological analysis where such analysis is considered likely to contribute significant information. Optically Stimulated Luminescence (OSL) samples would be taken in areas where Aboriginal objects are found, and generally try to bracket the deposit (to provide a maximum and minimum age). Material for radiocarbon (radiometric) analysis may also be undertaken opportunistically if archaeological features containing charcoal or other dateable material are evident.

  - Reduced levels of the top and bottom of the test pit would be documented using a dumpy level against a known elevation. Other levels may be taken as required.

- Excavation procedures and protocols may be modified at the discretion of the Excavation Director, in consultation with the RAPs and proponent as the conditions in the field and nature of the excavations develop. This includes the movement/discontinuance of test pits to avoid existing obstacles, buried services and disturbances.

At the completion of the Phase 1 test pits, consideration of the Phase 2 thresholds (Section D1.3) will be considered as to whether further excavations are required.

D.1.3 Thresholds for further excavation

The initiation of Phase 2 – salvage excavation – would *only* be undertaken in areas where the thresholds outlined below are met. The location of salvage excavations would be determined at the completion of the Phase 1 and at those locations where the greatest potential for answering the research questions (Section D1.1) is identified.

The thresholds for expansion would include:

- Stone artefact densities greater than 20/m^2 and therefore indicative of past occupation based on our broader understanding of the region.

- Where evidence of multiple phases of past activity is identified through changing raw material types and/or distinct technological attributes at different depths within the soil profile.

- Where dense concentrations of cultural materials are discovered at significant depths that may indicate extreme age.

- Where rare or unique stone artefacts and/or other archaeological material is recovered.

- Where unique and/or rare archaeological features (e.g. hearths, cooking pits, etc) are identified.

- Other conditions that are considered by the Excavation Director to inform the research questions and/or broader aims of the project.

D.1.4 Salvage excavations

Where suitable thresholds (Section D1.3) are met, additional archaeological excavations would be undertaken in these identified locations. These excavations are proposed to consist of contiguous open area salvage excavation using higher resolution recovery techniques. The number and size of these open area excavations would be dictated by the size of the identified cultural material, with smaller values of 25 m^2 (5 x 5 m) and up to 100 m^2 (10 x 10 m) being common sizes for such work.

The following methods would be adopted for all salvage excavations:

- Excavation:
  - Establishment of open area excavation area/s using a using a hand-held Leica RTK CS10/GS08 survey grade Differential GPS device (or equivalent).
  - All test pits would be dug manually using shovels, mattocks, trowels and other hand tools as required. Excavation would be undertaken as 1 m^2. Each square would be given an alpha-numeric label for identification purposes.
  - All excavation would be undertaken in 5 cm spits to the depth of 100 cm below surface, which has been shown as culturally sterile (EMM 2023). Depths of excavation would be adjusted as necessary based on the findings of the investigative phase.
  - All sediment would be placed in buckets, labelled according to its assigned test pit number and spit, and recorded and documented. All sediment would then be wet-sieved through a 5 mm wire aperture mesh, and any historic and/or Aboriginal cultural material recovered, labelled and bagged for subsequent analysis and curation.
- Field Documentation:
  - All excavations would be documented using photographic records, written descriptions and scaled drawings.
  - Soil profiles would be recorded in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010), including scaled drawings, photographs, and written descriptions.
  - Soil samples would be collected for description, sedimentological and chronological analysis where such analysis is considered likely to contribute significant information. Optically Stimulated Luminescence (OSL) samples would be taken in areas where Aboriginal objects are found, and generally try to bracket the deposit (to provide a maximum and minimum age). Material for radiocarbon analysis may also be undertaken opportunistically if archaeological features containing charcoal or other dateable material are evident.
  - Reduced levels of the top and bottom of the test pit, and at the top of each fourth spit would be documented using a dumpy level against a known elevation. Other levels may be taken as required.
- Excavation procedures and protocols may be modified at the discretion of the Excavation Director, in consultation with the RAPs and proponent as the conditions in the field and nature of the excavations develop. This includes the movement/discontinuance of test pits to avoid existing obstacles, buried services and disturbances.

D.1.5 Post excavation analysis and reporting

The post-excavation analysis (incorporating data from the excavations) would be designed to address the research objectives and aims, along with other relevant questions that may arise based on the results of the excavation. These would include, but not be necessarily limited to:

- Stone artefact analysis, including descriptive and functional recording of the assemblage, as well as interpretation of past activities, post-depositional change and comparison with other nearby data. Conjoining may also be attempted where sufficient cultural materials have been recovered. Geochemical analysis of stone artefacts for provenance and other material source research questions using X-Ray Fluorescence, Inductively Coupled Plasma Mass Spectrometry and/or Thermal Ionisaton Mass Spectrometry may also be undertaken. These samples would be processed either at Australia's Nuclear Science and Technology Organisation (ANTSO), University of Wollongong and/or University of New South Wales.

- Geochronology, including the processing and analysis of samples to inform the absolute age of the soil profile and/or cultural assemblage recovered. This would include Optically Stimulated Luminescence ages, as well as radiocarbon samples were recovered. While large number of these samples are likely to be collected, given the prohibitive cost of processing, it is probable that a small number of ages would be obtained in a small number of master-sequences to inform the broader archaeological program. The samples would be processed by either University of Gloucestershire and/or University of Wollongong.

- Geochemistry and soil analysis that would be used to further inform and interpret the formation history of the soil profile from which cultural materials are recovered. This would include the use of Itrax X-ray Fluorescence (XRF) core scanning methods at Australia's Nuclear Science and Technology Organisation (ANTSO), as well as particle size analysis to explore changes in the alluvial and colluvial history of the river corridor.

- Palaeo-environmental analysis, including palynology, phytolith analysis and/or charcoal analysis to explore the past vegetation and fire regimes that may have influenced and/or modified by past human activity. These would utilise the same samples collected for geochemistry and/or sampling and sent to a range of University specialists in these fields to process and interpret the results.

- Reporting that would provide information on the field investigations, compilation and synthesis of the post-excavation analyses, and interpretation of the results to inform the past activity and use of the region.

Appendix E
Complaints register

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Table E.1 Complaints register

Date	Contact made by (internal)	Contact received from (external)	Method	Details of communication

Appendix F
Document control

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Table F.1 Document revisions

Revision #	Date	Prepared by	Approved by	Consultation in accordance with Table 2.1? (Yes/No)	Description of changes	Page # of change
2	20/3/2024	Joel Mason	Alan Williams	Yes	Aligning the consent condition numbers in accordance with the updated SSDA. Updated Section 4.2.2 to state that implementation of this condition was conducted in February 2024 Updated communications log	1, 2, 3 15 Appendix A.1.

Table F.1 Document revisions

Revision #	Date	Prepared by	Approved by	Consultation in accordance with Table 2.1? (Yes/No)	Description of changes	Page # of change

Appendix G
Qualified Personal Curriculum Vitae

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Dr Alan Williams FSA FRSA MAACAI MEIANZ

Associate Director | Technical Lead – Aboriginal Heritage
EMM Consulting Pty Limited

Professional Overview

Alan is one of the leading archaeological consultants in Australia, having undertaken work in every Australian State and Territory. Alan has 20 years' experience in cultural heritage management (CHM), specialising in Aboriginal heritage, has acted in a range of public and private sector roles, and worked for clients in the government, residential, mining, energy, transport and infrastructure sectors. He has mentored ~20 archaeologists, managed some $25million of CHM projects encompassing ~450 projects, and has produced 200+ reports on archaeological sites (and associated developments). He routinely supervises large-scale archaeological excavations and is frequently sought out to troubleshoot complex and/or controversial projects.

He is also well established in academia, affiliated with multiple universities, and widely published on past Aboriginal demography, palaeoclimatology and other key archaeological debates.

Qualifications and licences

Doctor of Philosophy, The Australian National University, Canberra ACT, 2015

Master of Science, Quaternary Science, Royal Holloway University of London, 2001

Bachelor of Science (Hons) Joint Geography and Archaeology, University of Leicester, 1999

Professional memberships

Industry Fellow, Centre for Sustainable Futures, University Technology Sydney

Associate Investigator, ARC Centre of Excellence for Australian Biodiversity and Heritage, University of New South Wales

Adjunct Senior Lecturer – School of Biological, Earth and Environmental Sciences, University of New South Wales

Full member and Membership Committee Member, Association of Australian Consulting Archaeologists

Member, Environmental Institute of Australia and New Zealand

Editorial Advisory Committee Member, Australian Archaeology (- 2021)

Fellow, Society of Antiquaries of London

Fellow, Royal Society of Arts

Specialisation

Cultural heritage management

Aboriginal heritage

Representative experience

- Central West Orana REZ transmission project – Aboriginal Heritage Lead - Aboriginal heritage assessment, field investigations (including test excavations), Aboriginal stakeholder and consent authority liaison, cultural values mapping (WSP, EnergyCo).
- Oven Mountain Pumped Hydro Storage – Aboriginal Heritage Lead - Aboriginal heritage assessment, field investigations (including test excavations), Aboriginal stakeholder and consent authority liaison, cultural values mapping, (OMPS Pty Ltd/Alinta Energy).
- Muswellbrook Solar Farm – Aboriginal Heritage Lead - Aboriginal heritage assessment, field investigations (including test excavations), Aboriginal stakeholder and consent authority liaison (ESCO Pacific).
- Greater Penrith – Eastern Creek Place Strategy – Aboriginal Heritage Lead – Aboriginal heritage desktop and predictive modelling, cultural values mapping, policy and guidance on future development (Department of Planning, Industry and Environment).
- Dungowan Dam project – Aboriginal Heritage Lead - Aboriginal heritage assessment, field investigations (including test excavations), Aboriginal stakeholder and consent authority liaison, cultural values mapping, Aboriginal heritage approvals (Water NSW).
- Mole River Dam project – Aboriginal Heritage Lead - Aboriginal heritage assessment, field investigations (including test excavations), Aboriginal stakeholder and consent authority liaison, cultural values mapping, Aboriginal heritage approvals (Water NSW).
- Wyangala, Dungowan and Mole River Dam projects – Aboriginal Heritage Lead –Aboriginal heritage inputs into scoping report, engagement and communication strategy (Water NSW).
- Wollar preliminary regional investigation area – Aboriginal Heritage Lead – Aboriginal heritage review, predictive modelling, heritage risk identification (NSW DPIE).
- Burrawang to Avon Tunnel project – Aboriginal Heritage Lead – Route selection advice, Aboriginal heritage assessment, field investigations, Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (Water NSW).
- Moomba to Wilton gas pipeline (various activities) – Aboriginal Heritage Lead – Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (APA Group).
- Lake Cowal gold operations – Aboriginal Heritage Lead - Aboriginal heritage post-approval tasks, including test and salvage excavations, interpretation, Aboriginal stakeholder and consent authority liaison (Evolution Mining).
- Mamre Road Place Strategy – Aboriginal Heritage Lead – Aboriginal heritage assessment, field investigations, Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (Department of Planning, Industry and Environment).
- New Cobar complex mine – Aboriginal Heritage Lead – Aboriginal heritage assessment, field investigations, Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (Aurelia Metals).

- Limondale Solar Farm, Balranald– Aboriginal Heritage Technical Advisor – advice and management of human remains, Aboriginal consultation (Belectric).
- Far North Coast Schools – Aboriginal Heritage Lead – Aboriginal heritage assessment, field investigations, Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (Schools Infrastructure NSW).
- New England Solar Farm – Aboriginal Heritage Technical Advisor - Aboriginal heritage post-approval tasks, including on-site mitigation, strategy and QA review (UPC Renewables).
- Lake Cowal gold operations – Aboriginal Heritage Lead - Aboriginal heritage post-approval tasks, including test and salvage excavations, interpretation, Aboriginal stakeholder and consent authority liaison (Evolution Mining).
- HVO Continuation – Aboriginal Heritage Technical Advisor - Aboriginal heritage assessment, field investigations (including test excavations), Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals. (Glencore).
- Narran-Warrambool Reserve – Aboriginal Heritage Lead – development of framework reference document to inform future development activities across LGA (Department of Resources).
- Charles Street and Ferry Wharf landscape upgrades – Aboriginal Heritage Lead – Aboriginal heritage field investigations, Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (City of Parramatta Council).
- Windsor Bridge Replacement Project (NSW) – Aboriginal Heritage Lead – Aboriginal heritage post-approval tasks, including test and salvage excavations, interpretation, Aboriginal stakeholder and consent authority liaison (Transport for NSW).
- Moorebank Intermodal Terminal, Moorebank – Aboriginal Heritage Lead – Aboriginal heritage assessment, field investigations (test excavation), Aboriginal stakeholder and consent authority liaison, and post-approval mitigation (management plan, salvage excavations). (SIMTA and CPB Contractors).
- Granville Multi-Purpose Centre – Aboriginal Heritage Lead – Aboriginal heritage assessment, field investigations, Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (Cumberland City Council).
- Robin Thomas Reserve, Parramatta – Aboriginal Heritage Lead – Aboriginal stakeholder and consent authority liaison, Aboriginal heritage approvals (Transport for NSW).
- Ammaroo Phosphate Project, Ammaroo (NT) – Aboriginal Heritage Lead – Aboriginal heritage assessment, field investigations, Aboriginal stakeholder and consent authority liaison (Verdant Minerals).

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Mikhaila Chaplin

Archaeologist
EMM Consulting Pty Limited

Professional Overview

Mikhaila is an Archaeologist with over four years of assessment and fieldwork experience in NSW, Tasmania and overseas. She has been responsible for Aboriginal community engagement and the preparation of built heritage, historical and Aboriginal archaeological assessments for a range of small-scale Development Applications and State Significant Development projects NSW.

Qualifications and licences

Bachelor of Arts (Archaeology and Ancient History), University of Sydney, 2018

Work Health and Safety General Construction Induction Card

Rail Industry Worker Card

Working with children check

First Aid Training

Specialisation

Identification, assessment and management of Aboriginal cultural heritage sites

Aboriginal community engagement

Archaeological excavation

Representative experience

- Tabbita Channel feasibility study, due diligence assessment, Tabbita, NSW (Murrumbidgee Irrigation)
- Cumberland High School, Aboriginal community engagement, archaeological excavation, Carlingford, NSW (Schools Infrastructure NSW)
- Harbourside, historical archaeological excavation, Darling Harbour, NSW (Mirvac)
- Chief Mechanical Engineers Building, conservation management plan, Eveleigh, NSW (Transport for NSW)
- Large Erecting Shop SSDA, Aboriginal community engagement, Aboriginal cultural heritage assessment, historical archaeological assessment, Eveleigh, NSW (TAHE)
- The Sandstone Precinct, historical archaeological excavation and monitoring, Circular Quay, NSW (Essence Project Management on behalf of Pontiac Land Group)
- Longs Lane, heritage impact statements, archaeological excavation and monitoring, The Rocks, NSW (NashCap)
- Large Erecting Shop Planning Proposal, Aboriginal community engagement, Aboriginal cultural heritage study & statement of impact, non-Aboriginal heritage study, Eveleigh, NSW (TAHE)
- 388 Sussex Street, heritage impact assessment, historical archaeological assessment, Haymarket, NSW (Taurus Aurum Pty Ltd)
- 131 Henry Street, Aboriginal community engagement, due diligence assessment, Aboriginal cultural heritage assessment and methodology, historical archaeological assessment, Penrith, NSW (Penrith City Council)
- North Head fence, road and lookout upgrades, heritage impact statement, North Head, NSW (National Parks and Wildlife Services)
- 44-78 Rosehill St, Aboriginal community engagement, due diligence assessment, Aboriginal cultural heritage assessment, historical archaeological assessment, Redfern, NSW (Kippax Property)
- Redfern North Eveleigh Precinct Renewal, non-Aboriginal heritage study, Eveleigh, NSW (Transport for NSW)
- 38-42 Pirrama Rd, Aboriginal community engagement, due diligence assessment, Aboriginal cultural heritage assessment, AHIP application, archaeological excavation and post excavation archaeological assessment, Pyrmont, NSW (Google)
- 502-514 Elizabeth St and 272-276 Cleveland St, Aboriginal community engagement, Aboriginal archaeological technical reports, Surry Hills, NSW (Podia on behalf of AIDOP No 7 Pty Ltd)
- Ultimo Powerhouse Stage 1 SSDA, Aboriginal community engagement, due diligence assessment, historical archaeological assessment, Ultimo, NSW (Create NSW)
- Locomotive Workshops, archaeological excavation, moveable heritage, Eveleigh, NSW (Mirvac)
- Clarence Correctional Centre Transmission Line, lithic analysis, Clarence Valley, NSW (Infrastructure NSW)
- 20 Waterview St, archaeological excavation and lithic analysis, Putney, NSW (Lilac Pty Ltd/Drivas Group)
- Devonshire Street Cemetery, historical archaeological excavation, Sydney Central Station, NSW (Transport for NSW)
- Parramatta Light Rail, archaeological excavation, Parramatta, NSW (Transport for NSW)

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Historical Heritage

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Geoarchaeology

GIS

Project planning and pre-fieldwork logistics

Surveying and excavation

Representative experience

- Seaham Quarry Project, Statement of Heritage Impact, Seaham NSW (Boral Australia Pty Ltd)
- 924 Hunter Street Newcastle, Excavation Report, Newcastle (Thirdi Dairy Farmers Pty Ltd)
- Luddenham Road 132kV Feeder Installation, Excavation Report and
- Oven Mountain Pumped Hydro Energy Storage, Statement of Heritage Impact, Oven Mountain NSW (OMPS Pty Ltd)
- Sandy Creek Solar Farm, Statement of Heritage Impact, Dunedoo NSW (Lightsource BP Pty Ltd)
- General John Baker Complex Redevelopment, Aboriginal cultural heritage assessment and archaeological excavation, Bungendore NSW (Defence)
- Victoria Barracks Gate Installation, Historic Impact Assessment, Paddington NSW (Defence)
- Rose Valley Environmental Impact Statement, Statement of Heritage Impacts, Rose Valley NSW (Schottlanders Wagyu)
- HMAS Watson Chapel Rejuvenation Project, Heritage Impact Assessment, South Head NSW (Defence)
- Randwick Barracks Roof Installation Project, Heritage Impact Assessment, Randwick NSW (Defence)

Publications

- Mason, J. Denham, T. Lin, E, Grono, E. (2022) QEMSCAN® analysis of clay-rich stratigraphy associated with early agricultural contexts at Kuk Swamp, Papua New Guinea. *Journal of Archaeological Science: Reports*.

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A.10 Cultural Heritage Management Sub-Plan (CHMSP)

AUSTRAL ARCHAEOLOGY

NEWCASTLE HIGH SCHOOL

25A NATIONAL PARK STREET, NEWCASTLE, NSW

CONSTRUCTION HERITAGE MANAGEMENT SUB-PLAN

Prepared for Hansen Yuncken

05 April 2024

Final

DOCUMENT INFORMATION

PROJECT DETAILS

Project: Newcastle High School

Client: Hansen Yuncken

Service: Cultural Heritage Management Sub-Plan

Authors: David Marcus (Director, Austral)

Project number: 24011

DOCUMENT HISTORY

Version No.	Version Type	Issue Date	Authored By	Approved By	Date Approved
1	Draft	2/4/2024	DM	-	2/4/2024
2	Final Draft	2/4/2024	-	DM	2/4/2024
3	Final	5/4/2024	-	DM	5/4/2024

DISTRIBUTION OF COPIES

Version No.	Quantity	Issue Date	Issued to
1	1	2/4/2024	Hansen Yuncken
2	1	2/4/2024	Hansen Yuncken
3	1	5/4/2024	Hansen Yuncken

ACKNOWLEDGEMENT OF COUNTRY

We respect and acknowledge the First Nations Peoples of the lands and waterways on which we live and work, their rich cultural heritage, and their deep connection to Country, and we acknowledge their Elders past and present.

CULTURAL WARNING

Aboriginal and Torres Strait Islander readers are advised that this report may contain images or names of First Nations people who have passed away.

AUSTRAL
ARCHAEOLOGY

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1 INTRODUCTION

1.1 CONTEXT

This Construction Heritage Management Sub Plan (CHMSP or The Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Newcastle Education Campus Project (the Project).

This CHMSP has been prepared by Austral Archaeology Pty Ltd (Austral) to address the requirements of the Minister's Instrument of Consent (IoC) issued for the Project (SSD-41814831) and all applicable legislation.

1.2 BACKGROUND

This Project is being undertaken on behalf of the Department of Education, who have proposed the following works be undertaken:

> *Staged upgrades to Newcastle High School comprising demolition, relocation and refurbishment of existing buildings, construction of new buildings, covered walkways, drop-off/pick up, waste and sporting facilities, tree removal, landscaping, and ancillary works including public domain infrastructure* (SSD-41814831).

The Project has been assessed as being a State Significant Development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EPA Act). The Environmental Impact Statement (EIS) for the Project summarised the key findings of the assessment impacts to Aboriginal and Non-Aboriginal Heritage (Gyde 2023). It identified the potential for impacts on items of both Aboriginal cultural heritage and historical heritage values during construction of proposed works, and included a recommendation of mitigation measures to minimise these impacts. The EIS was supported by a Statement of Heritage Impact (SoHI) detailing potential impacts to built heritage items (EJE Heritage 2023), an archaeological assessment detailing potential impacts to historical archaeological items (EMM Consulting Pty Ltd 2023a), and an Aboriginal Cultural Heritage Assessment (ACHA) detailing potential impacts to Aboriginal cultural material (EMM Consulting Pty Ltd 2023b).

Hansen Yuncken (HY) has been engaged to undertake the various tasks required to complete the Project. This CHMSP describes the environmental management measures that HY will implement during the construction work in terms of built heritage and historical archaeological material. Consideration of impacts to Aboriginal cultural material is to be managed through a separate Aboriginal Cultural Heritage Management Sub-Plan.

1.3 ENVIRONMENTAL MANAGEMENT SYSTEMS OVERVIEW

The overall Environmental Management System for the Project is described in the CEMP. The CHMSP is part of the wider environmental management framework for the Project, as described in Section 4.7 of the CEMP.

In accordance with Condition B14 of the IoC, The CHMSP is to be approved by the Certifier as a component of the CEMP, and is to form part of the documentation given to the Planning Secretary for information purposes.

Management measures identified in this Plan will be incorporated into site or an activity specific Environmental Work Method Statement (EWMS) as required. EWMS will be developed if necessary and signed off by environment and management representatives prior to associated works commencing and construction personnel will be required to undertake works in accordance with the identified mitigation and management measures.

Used together, the CEMP, strategies, procedures and EWMS form management guides that clearly identify required environmental (including heritage) management actions for reference by HY personnel and contractors.

1.4 ABBREVIATIONS

The following are common abbreviations that are used within this report:

AA&MS	Archaeological Assessment and Management Strategy
ACHA	Aboriginal Cultural Heritage Assessment
ACHP	Aboriginal Cultural Heritage Plan
AER	Archaeological Excavation Report
ARD	Archaeological Research Design
ARR	Archival Recording Report
Austral	Austral Archaeology Pty Ltd
Burra Charter	*Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance 2013*
CEMP	Construction Environmental Management Plan
CHMSP	Construction Heritage Management Sub-Plan
DoE S170 Register	Register of heritage items maintained by the Department of Education in accordance with Section 170 of the Heritage Act
EIS	Environmental Impact Statement
EPA Act	*NSW Environmental Planning and Assessment Act 1979*
EPBC Act	*Environmental Protection and Biodiversity Act 1999*
EWMS	Environmental Work Method Statement
HAA	Historical Archaeological Assessment
HCA	Heritage Conservation Area
HIP	Heritage Interpretation Plan
HY	Hansen Yuncken
IoA	Instrument of Approval
Heritage Act	*NSW Heritage Act 1977*
Newcastle LEP	*Newcastle Local Environmental Plan 2012*
NPW Act	*NSW National Parks and Wildlife Act 1974*
The Project	Newcastle Education Campus Project
SoHI	Statement of Heritage Impact
UFP	Unexpected Finds Procedure

2 PURPOSE AND OBJECTIVES

2.1 PURPOSE

The purpose of this Plan is to describe how impacts on built heritage and historical archaeological material will be minimalised and managed during construction works associated with the Project.

The Plan includes but is not necessarily be limited to:

- Details of management measures and strategies for protection, excavation, salvage and archival recording, and/or conservation of non-Aboriginal heritage items and sites that will be directly or indirectly impacted during construction;
- A methodology for further archaeological investigations, salvage measures and/or measures to protect unaffected sites during construction works in the vicinity and to guide their future interpretation; and,
- Procedures for dealing with previously unidentified non-Aboriginal finds, comprising cessation of works in the vicinity, assessment of the significance of the item(s) and determination of appropriate mitigation measures; and,

2.2 OBJECTIVES

The key objective of the CHMSP is to ensure that impacts to non-Aboriginal heritage are minimised and within the scope permitted by the planning approval. To achieve this objective, the following will be undertaken:

- Ensure appropriate measures are implemented to address the relevant conditions of the IoA and environmental management measures outlined in Table 3.1 and any relevant mitigation strategies detailed in the EIS;
- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts to historic heritage within the Project footprint and beyond;
- Avoid damage or destruction following the unexpected discovery of any items of historic heritage significance during construction and post-construction phases of the work;
- Ensure items of non-Aboriginal heritage value are managed during construction and post construction phases of the work in accordance with best heritage practice;
- Provide staff with an increased level of understanding and awareness of heritage management issues.
- Ensure effective communication is maintained with statutory authorities and all statutory requirements are met to control impacts on items of historical heritage value; and,
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 of this Plan.

2.3 TARGETS

The following targets have been established for the management of maritime, Aboriginal cultural heritage and historic heritage impacts during the project:

- Ensure full compliance with the relevant legislative requirements;
- Ensure full compliance with the conditions of the IoA and EIS;
- Minimise or avoid impacts to known historic heritage sites or values, and their heritage significance;
- Follow correct procedure and notification protocols for the management of any unexpected historic heritage objects/places uncovered during construction; and,
- Ensure heritage awareness training is provided to all personnel in the form of inductions before they begin work on-site.

3 ENVIRONMENTAL HERITAGE REQUIREMENTS

3.1 RELEVANT LEGISLATION AND GUIDELINES

3.1.1 LEGISLATION

Legislation relevant to historical heritage management includes:

- *Environmental Planning and Assessment Act 1979 (EPA Act)*
- *NSW Heritage Act 1977 (Heritage Act)*

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Section 4.7.3 of the CEMP.

3.1.2 GUIDELINES

The main guidelines, specifications and policy documents relevant to this Plan include:

- *Archaeological Assessment Guidelines* (Heritage Office and Department of Urban Affairs & Planning. 1996)
- *Assessing Heritage Significance* (Department of Planning and Environment 2023a)
- *Assessing Significance for Historical Archaeological Sites and 'Relics'* (Heritage Council of New South Wales 2009)
- *Criteria for Assessing Excavation Directors* (Heritage Council of NSW 2019)
- *Guidelines for the Preparation of Archaeological Management Plans* (Heritage Branch 2009)
- *Guidelines for Preparing a Statement of Heritage Impact* (Department of Planning and Environment 2023b)
- *Heritage Curtilages* (Heritage Office and Department of Urban Affairs & Planning 1996)
- *Historical Archaeology Code of Practice* (Heritage Office & Department of Planning 2009)
- *How to Prepare Archival Recording of Heritage Items* (Heritage Office 1998)
- *Interpreting Heritage Places and Items Guidelines* (NSW Heritage Office 2005)
- *NSW Heritage Manual* (Heritage Office and Department of Urban Affairs & Planning 1996)
- *Photographic Recording of Heritage Items Using Film or Digital Capture* (NSW Heritage Office 2006)

3.2 MINISTER'S CONDITIONS OF APPROVAL

The conditions of the IoA relevant to this Plan are listed in Table 3.1 below. A cross-reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

Table 3.1 Location of information in this plan addressing requirements of the IoA.

Condition	Condition Requirement	Location
B9	**Community Communication Strategy** No later than 48 hours before the commencement of construction, a Community Communication Strategy must be submitted to the Planning for information. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development, and for a minimum of 12 months following the completion of construction. The Community Communication Strategy must: … (e) include any specific requirements around traffic, noise and vibration, tree retention, **heritage.**	Community Communication Strategy
B14	**Construction Environmental Management Plan** Prior to the commencement of any construction, the Applicant must submit a CEMP to the Certifier and provide a copy to the Planning Secretary for information. The CEMP must include, but not be limited to, the following: (c) an unexpected finds protocol for Aboriginal and **non-Aboriginal heritage**…	Section 6.1.5
	(c) cont'd …and associated communications procedure.	Community Communication Strategy
	(i) Cultural Heritage Management Sub-Plan.	This document
B20	The CHMSP must address, but not be limited to, the following: (a) suitably qualified and experienced expert(s) are to identify any significant internal and external elements of the buildings that will be demolished for salvage and, if necessary, storage, for reuse as appropriate, including future interpretation opportunities. Removal of any items to be carried out in accordance with specific salvage methodologies provided by the qualified and experienced expert(s);	Section 6.1.4
	(b) photographic archival records and must: (i) be prepared in accordance with the NSW Heritage Branch guidelines titled Photographic Recording of Heritage Items using Film or Digital Capture; (b) (ii) be of the external and internal areas of the buildings on site and all other items of heritage significance on the site identified in the Statement of Heritage Impact prepared by EJE Heritage dated May 2023; and (b) (iii) must be submitted to Council and the Planning Secretary;	Section 6.1.1
	(c) historical archaeological excavations and must be undertaken by a suitably qualified and experienced professional, in accordance with the requirements of the Heritage NSW within the areas of archaeological potential identified within the Archaeological Assessment and Statement of Heritage Impact prepared by [EMM] dated May 2023.	Section 6.1.2 Section 6.1.3

Condition	Condition Requirement	Location
C29	**Unexpected Finds Protocol – Historic Heritage** If any unexpected archaeological relics are uncovered during the work, then: (a) all works must cease immediately in that area and notice must be given to Heritage NSW and the Planning Secretary; (b) depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area as determined in consultation with Heritage NSW; and (c) works may only recommence with the written approval of the Planning Secretary.	Section 6.1.5
D22	The Applicant must prepare an archaeological report of the salvage excavation undertaken in accordance with condition B19 and B20. An interim report of the salvage excavation must be provided to the Certifier for information within one month of completion of the salvage work and a final report provided within 12 months of completion of the salvage work or within another timeframe agreed with the Planning Secretary. Copies of the report must also be provided to Heritage NSW and Council.	Section 6.1.3
D34	**Heritage Interpretation Plan** A Heritage Interpretation Plan to acknowledge the heritage of the site, must be submitted to the Certifier. The plan must: (a) be prepared by a suitably qualified and experienced expert in consultation with Heritage NSW and Council; (b) include provision for naming elements within the development that acknowledges the site's heritage, such as the history of the various heritage buildings or potential archaeology uncovered during the works; and (c) incorporate interpretive information in relation to the use of the site.	Section 6.1.4
E8	**Heritage Interpretation Plan** The Applicant must implement the most recent version of the Heritage Interpretation Plan approved under condition B20.	Section 6.1.4

4 EXISTING ENVIRONMENT

The following sections summarise what is known about Aboriginal and non-Aboriginal heritage within and adjacent to the Project area. The key reference document for historical heritage are Section 6.4.1 of the EIS (Gyde 2023, 77–80), the SoHI prepared by EJE Heritage (2023) and the archaeological assessment prepared by EMM (2023b).

4.1 NON-ABORIGINAL HERITAGE

4.1.1 HISTORICAL ARCHAEOLOGICAL HERITAGE

The archaeological assessment includes the following site development history:

> *In 1863, James Hannell and his investment group leased land for the racecourse from Australian Agricultural Company (AACO)…In doing so they created the Newcastle Racing Club, later Newcastle Jockey Club. The initial lease was originally for 7 years but lasted over 40 years with AACO still owning the land and having rights to bore for coal. Grass was cleared and fences constructed for the first race on 5 Oct 1865 and by 1872 buildings had been added including: a Grandstand (extended 1875), luncheon room and private rooms for ladies. The racecourse straight in front of the Grandstand would become the future Dumaresq Street that once bisected Newcastle High School meaning that the main racecourse public area was located in the northern half of the Newcastle High School study area (EMM Consulting Pty Ltd 2023b, 19–20).*

Structures associated with the racecourse which were identified as having archaeological potential and which may be impacted by the proposed works are:

- The Grand Stand;
- Leger Stand;
- Judge's Box;
- Telegraph Office; and,
- Well (EMM Consulting Pty Ltd 2023b, 19, 37, 45).

It is noted that the archaeological assessment does not specifically address the potential for the actual race course itself to be present within the study area or impacted by the proposed works. However, this is assessed as being high and will be considered in the mitigation measures included in this CHMSP.

Following the closure of the racecourse, the archaeological assessment notes the following history for the site:

> *…the future site of Newcastle High School was used as a golf course… grazing area and occasionally a dumping ground known as Shedden Park…The remnants of the old racecourse track were still being noted on mapping from the period. The issues of dumping in the park was apparently a significant issue to locals with numerous letters to the editor being published. In 1913 a notice in the newspaper reported that Shedden Park included all manner of waste, including building debris, the burial of a horse, rabbit carcasses and most disturbingly of all "accumulation of years from the infections disease ward of the hospital…" (EMM Consulting Pty Ltd 2023b, 20).*

4.1.2 BUILT HERITAGE VALUES

The following site development history for the school buildings is quoted from the EIS:

> *Newcastle High School was established in 1906 within the campus of the Newcastle East Public School. The primary school relocated in 1911 and the High School expanded to 286 students by 1912. Government policy of the time was to create segregated schools in locations within sufficient population, and this was seen to be the case in Newcastle. In November 1925, the Government purchased the southern portion (Parkway Avenue to Dumaresq Street) of the current school site. Two years later it obtained the northern portion of the site by compulsory acquisition of a section of National Park. It was intended that separate boys and girls schools would be constructed on the site.*
>
> *The girls school was constructed first and consisted of Buildings A, K and L. The foundation stone was laid by D.H Drummond Minister for Education in December 1928 and the school was officially opened in March 1930…*
>
> *Building A contains the foundation stone and is the main frontage of the school, presenting a grand entrance to Parkway Avenue. The building is two-storey in a symmetrical U shape. Modifications to the building have occurred including demolition of the single storey demonstration room in 1964 to connect Block A to Block B. In 1976, when the Newcastle Girls' High School was refitted to become co-educational, a major internal renovation was undertaken which included new internal walls and replacement of the slate roof with terracotta tiles. The SoHI concludes that Building A is typically in good condition with the only obvious dilapidation being paint.*
>
> *Building L was constructed as an assembly hall with a capacity of 545 students. It included the detailing which was applied to Building A and has stuccoed entrances and window surrounds.*
>
> *Building K was a gymnasium and constructed of brick with slate roof to match the other buildings. The building had large sliding doors on its southern façade which allowed the gym floor to open onto a wide verandah. It contained the school's first canteen, P.E instructor's office, locker rooms, shower and lavatories. Its external finish was simpler in detail than Building A and L.*
>
> *Building H is a portable building having been introduced circa 1954 and already relocated within the site at least once.*
>
> *Plans for Building C located on the allotment north of Dumaresq Street were prepared and in a departure from the previous intent, was not for a Boys High School but for the Newcastle Central Domestic Science School. The building was designed in a simpler but still impressive style.*
>
> *A portion of the site is located within the Hamilton South 'Garden Suburb' Heritage Conservation Area (HCA). The HCA is significant to the local community for the surviving evidence of an early 20th Century subdivision pattern made up of single dwellings on large 'suburban' style allotments generally over 600* [metres^2]. *The area has associational significance with the eminent Australian architect Sir John Sulman.*

The SOHI identifies a number of trees as possible heritage trees and other trees have been categorised as being of high retention value if maintained in their existing groups. The 'possible heritage trees' are mature age 'Hills Weeping Figs', 'Norfolk Island Pines', and 'Small-Leaf Figs'. The high retention value trees are typically 'Brush Box', 'London Plane Trees', 'Angophoras' and 'Sydney Blue Gums' (Gyde 2023, 77–78).

4.1.3 HERITAGE LISTINGS

The site is an item of local environmental heritage and listed under Schedule 5 of the *Newcastle Local Environmental Plan 2012* (Newcastle LEP) as "Newcastle High School" (Item I174) and the southern portion of the site is also located within the "Hamilton South Garden Suburb" HCA (Item C3).

The site curtilage (SHI #5065645) and various buildings (SHI #5065628) are also listed on the register of heritage items maintained by the Department of Education in accordance with Section 170 (DoE S170 Register) of the Heritage Act.

An overview of these listings along with those of additional heritage items in the vicinity of the Project area are listed on the Local Environmental Plan in Table 4.1 below.

Table 4.1 Heritage items within and in proximity to the Project area

Item Name	Item Number	Register	Significance	Distance from Project Area
Newcastle High School	I174	Newcastle LEP	Local	n/a
	SHI #5065645	DoE S170 Register	Local	n/a
Newcastle High School – Buildings B00A-B00W, B00G-B00I, B00L and B00p	SHI #5065628	DoE S170 Register	Local	n/a
Parkway Avenue, including verges, median strips, public footpaths, public roads, kerbs and gutters, street trees, garden beds, bridges and stormwater drains	I704	Newcastle LEP	Local	10m at closest point
House	I175	Newcastle LEP	Local	240m
Fig Trees	I161	Newcastle LEP	Local	250m
Hamilton South Garden Suburb Heritage Conservation Area	C3	Newcastle LEP	Local	n/a

5 ENVIRONMENTAL ASPECTS AND IMPACTS

5.1 CONSTRUCTION ACTIVITIES

Key aspects of the project that could result in adverse impacts to historic heritage include:

- Demolition works;
- Relocation and refurbishment of existing buildings;
- Construction of new buildings, covered walkways, drop-off/pick up areas, waste facilities and sporting facilities;
- Tree removal;
- Landscaping; and,
- Ancillary works including public domain infrastructure.

5.2 NON-ABORIGINAL HERITAGE IMPACTS

5.2.1 BUILT HERITAGE

The EIS identified that Project works are being undertaken within the Hamilton South Garden Suburb HCA and in the vicinity of 4 listed heritage items. Of these, only the Newcastle High School itself and its associated buildings will be subject to direct impacts. The remaining items are subject to a range of indirect impacts, some of which will be ongoing (e.g. visual impacts) and some of which will be construction-related (e.g. noise and vibration). Table 5.1 summarises identified impacts in relation to non-Aboriginal built heritage sites.

Table 5.1 Built Heritage – Impacts and management.

Item Name and Listing	Impacts	Heritage Significance and Implication
Newcastle High School Newcastle LEP (Item I174) S170 Register (#5065645)	Works to include demolition of buildings, relocation and refurbishment of other buildings, construction of new buildings, covered walkways, drop-off/pick up areas, waste facilities and sporting facilities, tree removal, landscaping; and ancillary works including public domain infrastructure.	Local significance. Widespread and irreversible impacts across the entirety of the curtilage including the removal of buildings. The level of impact on heritage values will be major.
Newcastle High School; Building A Newcastle LEP (Item I174) S170 Register (#5065628; B00A)	No direct impact. Construction of covered walkway to link Building A and the new learning hub.	Exceptional local significance. New building has been designed to be complementary to Building A. The level of impact on heritage values will be minor.
Newcastle High School; Building B Newcastle LEP (Item I174) S170 Register (#5065628; B00B)	Demolition of building.	Moderate to high local significance. Widespread and irreversible damage from its demolition. The level of impact on heritage values will be major.

Item Name and Listing	Impacts	Heritage Significance and Implication
Newcastle High School; Building C Newcastle LEP (Item I174) S170 Register (#5065628; B00C)	No direct impact. Construction of covered walkway and landscaped area between Building C and the new learning hub.	Exceptional local significance. New building and landscaped area have been designed to be complementary to Building C. The level of impact on heritage values will be minor.
Newcastle High School; Building D Newcastle LEP (Item I174) S170 Register (#5065628; B00D)	Demolition of building.	Moderate local significance. Widespread and irreversible damage from its demolition. The level of impact on heritage values will be major.
Newcastle High School; Building E Newcastle LEP (Item I174) S170 Register (#5065628; B00E)	Demolition of building.	Moderate local significance. Widespread and irreversible damage from its demolition. The level of impact on heritage values will be major.
Newcastle High School; Building G Newcastle LEP (Item I174) S170 Register (#5065628; B00G)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Moderate local significance. No implications to this item. The level of impact on heritage values will be nominal.
Newcastle High School; Building H Newcastle LEP (Item I174) S170 Register (#5065628; B00H)	Building to be moved from outside of the conservation area and into a part of the site within the conservation area.	Moderate local significance. New location will enhance the significance of the building and ensure its ongoing relevance. The level of impact on heritage values will be moderate.
Newcastle High School; Building I Newcastle LEP (Item I174) S170 Register (#5065628; B00I)	Demolition of building.	Moderate local significance. Widespread and irreversible damage from its demolition. The level of impact on heritage values will be major.
Newcastle High School; Building J Newcastle LEP (Item I174) S170 Register (#5065628; B00J)	Demolition of building.	Moderate local significance. Widespread and irreversible damage from its demolition. The level of impact on heritage values will be major.
Newcastle High School; Building K Newcastle LEP (Item I174) S170 Register (#5065628; B00K)	Removal of existing walkway linking Building K and Building J and internal refurbishments.	Minor local significance. Localised and generally reversable changes to the interior of the building. The level of impact on heritage values will be minor.

Item Name and Listing	Impacts	Heritage Significance and Implication
Newcastle High School; Building L Newcastle LEP (Item I174) S170 Register (#5065628; B00L)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Moderate local significance. No implications to this item. The level of impact on heritage values will be nominal.
Newcastle High School; Building M Newcastle LEP (Item I174) S170 Register (#5065628; B00M)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Minor local significance. No implications to this item. The level of impact on heritage values will be nominal.
Newcastle High School; Building N Newcastle LEP (Item I174) S170 Register (#5065628; B00N)	Demolition of building.	Low local significance. Widespread and irreversible damage from its demolition. The level of impact on heritage values will be major.
Newcastle High School; Building O Newcastle LEP (Item I174) S170 Register (#5065628; B00O)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Minor local significance. No implications to this item. The level of impact on heritage values will be nominal.
Newcastle High School; Building P Newcastle LEP (Item I174) S170 Register (#5065628; B00P)	Demolition of building.	Moderate local significance. Widespread and irreversible damage from its demolition. The level of impact on heritage values will be major.
Parkway Avenue, including verges, median strips, public footpaths, public roads, kerbs and gutters, street trees, garden beds, bridges and stormwater drains Newcastle LEP (Item I704)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Local significance. No implications to this item. The level of impact on heritage values will be nominal.
House Newcastle LEP (Item I175)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Local significance. No implications to this item. The level of impact on heritage values will be nominal.
Fig Tree Newcastle LEP (Item I161)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Local significance. No implications to this item. The level of impact on heritage values will be nominal.
Hamilton South Garden Suburb Heritage Conservation Area Newcastle LEP (Item C3)	No direct impact. Indirect impacts in the form of temporary construction-related impacts and minor visual intrusion following construction.	Local significance. No implications to this item. The level of impact on heritage values will be nominal.

5.2.2 NON-ABORIGINAL HISTORICAL ARCHAEOLOGY

The EIS identified that Project works are also to be undertaken within areas noted in the Archaeological Assessment as having potential for historical archaeological material to be present. Archaeological testing and potentially salvage is to be undertaken prior to construction, in accordance with the methodology outlined in an Archaeological Research Design (ARD). Archaeological heritage likely to be present in the Project area are outlined below in Table 5.2.

Table 5.2 Non-Aboriginal archaeological heritage – Impacts and management.

Item Name and Listing	Impacts	Heritage Significance and Implication
Former Newcastle Racecourse No formalised listing	Construction process may impact on archaeological remains associated with the former racecourse and buildings.	Local significance. Widespread and irreversible impacts to any archaeological remains not already disturbed by later development. The level of impact on heritage values will be major.
Newcastle High School Newcastle LEP (Item I174) S170 Register (#5065645)	Construction process may impact on archaeological remains associated with the former buildings identified on earlier aerial imagery of the Project area.	Local significance. Widespread and irreversible impacts to any archaeological remains not already disturbed by later development. The level of impact on heritage values will be major.

6 ENVIRONMENTAL MITIGATION AND MANAGEMENT MEASUREMENTS

A range of mitigation requirements and control measures are identified in the EIS and the conditions outlined in the IoA.

6.1 NON-ABORIGINAL HERITAGE MITIGATION STRATEGIES

6.1.1 ARCHIVAL PHOTOGRAPHIC RECORDING

A suitably qualified heritage specialist will be engaged to prepare an archival photographic recording of heritage sites in accordance with *How to prepare archival records of heritage items* (Heritage Office 1998) and *Photographic Recording of Heritage Items Using Film or Digital Capture* (NSW Heritage Office 2006).

Archival recording will be carried out for heritage items in accordance with the relevant Management Measure outlined in Table 6.1 prior to commencement of work that may impact on the items. This will include photography of the individual characteristics of each element with an emphasis on aspects which provide it with specific significance. All aspects of each specified block will be subject to photographic recording including views to and to and from each element to detail their relationship with the surrounding landscape.

Data collection for the archival recording will include the following tasks:

- A photographic catalogue that consists of an index of photographs as per the requirements of the *Photographic Recording of Heritage Items Using Film or Digital Capture* (NSW Heritage Office 2006). The catalogue will include information relating to the photographer, content, orientation and camera specifications. The catalogue will be cross referenced with a plan that shows the location and sequence in which the photographs were taken.
- A detailed plan will be prepared which consists of basic scale drawings of each heritage item including its floor plan and elevations.

Sites requiring archival photographic recording are:

- Block B
- Block I
- Block P

The final Archival Recording Report (ARR) is to be submitted to Newcastle City Council and the Planning Secretery.

6.1.2 ARCHAEOLOGICAL TEST EXCAVATIONS

Archaeological excavations will be carried out under the supervision of a suitability qualified archaeologist who meets the *Criteria for Assessing Excavation Directors* for test excavation of a site of local significance (Heritage Council of NSW 2019). Prior to commencement, the archaeologist is to prepare an ARD, which will define the methodology for undertaking historical archaeological test excavation of areas of archaeological potential which are to be impacted by the proposed design through the excavation of archaeological test trenches and subsequent archaeological monitoring or open area excavation.

The archaeological excavations are to target the location of areas marked as being of medium or high archaeological potential on Figure 7.1 of the Archaeological Assessment (EMM Consulting Pty Ltd 2023b, 45), and the results of the archaeological testing program are to be documented in an interim Archaeological Excavation Report (AER).

6.1.3 ARCHAEOLOGICAL SALVAGE EXCAVATIONS

In the even that archaeological material or relics are identified, the need for undertaking open area or salvage excavations will be dictated by the requirements of the ARD. Further works may include seeking avoidance through the changing of construction plans or recording and removing archaeological remains, dependant on the level of preservation and significance of the material. Archaeological excavations will be carried out under the supervision of a suitability qualified archaeologist who meets the *Criteria for Assessing Excavation Directors* for larger scale / complex excavation of a site of local significance.

The results of any archaeological salvage excavations are to be documented in an AER.

6.1.4 HERITAGE INTERPRETATION PLAN

A Non-Aboriginal Heritage Interpretation Plan (HIP) is to be prepared for the Project by the heritage advisor in order to fulfill the requirement of Condition D34 of the IoA. The Non-Aboriginal HIP will include consideration of elements to enable the continued interpretation and understanding of heritage values associated with the Project area in the form of a succinct report that includes:

- An outline of the heritage values of the study area and applicability of interpretive media as part of the development layout;
- Identification of any significant internal or external elements of buildings set for demolition which are suitable for retention and/or re-use as appropriate for interpretative purposes;
- Consideration of suitable names for elements of the new design;
- Identification of optimal locations for interpretive media within the development footprint;
- Draft text and images for incorporation into interpretive media;
- The incorporation of one set of consolidated comments from Heritage NSW and Newcastle City Council concerning the content of the Heritage HIP.

6.1.5 UNEXPECTED FINDS PROCEDURE

An Unexpected Heritage Finds Procedure (UFP) will be implemented for the duration of the Project. This procedure has been prepared by a suitably qualified and experienced heritage specialist in accordance with relevant guidelines and standards.

6.2 MANAGEMENT MEASURES

Specific measures and requirements to address impacts on heritage values are discussed below and outlined in Table 6.1.

Table 6.1 Heritage management and mitigation measures.

ID	Measure / Requirement	Stage	Responsible Party	Reference	Relevant Internal Documents	Evidence of Implementation
NAH1	Prepare a Cultural Heritage Management Sub-Plan for the Project.	Pre-construction	Heritage Consultant	IoA Condition B14(i) IoA Condition B20	N/A	CHMSP (this document)
NAH2	Identify and record any significant internal or external elements of buildings which are set for demolition and oversee their salvage, storage, and potential use in future interpretative opportunities.	Pre-construction	Heritage Consultant	IoA Condition B20(a)	Section 6.1.4	ARR HIP
NAH3	A suitably qualified and experience heritage consultant is to prepare a Heritage Interpretation Plan (HIP) in consultation with Heritage NSW and Newcastle City Council, and be submitted to the Certifier. The HIP is to include provision for naming elements within the site and incorporate means of providing interpretative information in relation to the use of the site.	Pre-construction Construction Post-construction	Heritage Consultant Certifier	IoA Condition D34 IoA Condition E8	Section 6.1.4	Final HIP
NAH4	Provide any specific inputs required in terms of heritage for the Community Communication Strategy	Pre-construction	Heritage Consultant	IoA Condition B9(e) IoA Condition B14(c)	N/A	Community Communication Strategy
NAH5	Undertake photographic archival recording in accordance with all relevant guidelines of Block B, Block I and Block P, as identified in the SoHI.	Pre-construction	Heritage Consultant	EIS Measure 13 IoA Condition B20(b)(i) and (ii)	CHMSP Section 6.1.1	ARR

ID	Measure / Requirement	Stage	Responsible Party	Reference	Relevant Internal Documents	Evidence of Implementation
NAH6	Submit a copy of the final ARR to Newcastle City Council and the Planning Secretery.	Construction	Heritage Consultant	IoA Condition B20(b)(iii)	CHMSP Section 6.1.1	ARR
NAH7	Undertake archaeological investigations in accordance with the methodology outlined in the ARD in the form of testing, salvage and monitoring, as required.	Pre-construction	Heritage Consultant	EIS Measure 14(a) EIS Measure 16(a) IoA Condition B20(c)	CHMSP Section 6.1.2 CHMSP Section 6.1.3 ARD	AER
NAH8	No non-Aboriginal archaeological excavation works shall only occur after completion of the Aboriginal Cultural Heritage Plan (ACHP).	Pre-construction	Environmental Manager	EIS Measure 14(b)	Aboriginal Cultural Heritage Plan (ACHP)	ACHP
NAH9	An interim report detailing the results of salvage excavations must be provided to the Certifier for information purposes within 1 month of the completion of salvage works.	Pre-construction	Heritage Consultant Certifier	IoA Condition D22	CHMSP Section 6.1.3 ARD	Interim AER
NAH10	The AER is to be finalised within 12 months of the completion of salvage works unless another timeframe is agreed with the Planning Secretery, and a copy of the final report must be provided for information purposes to the Certifier, Heritage NSW, and Newcastle City Council.	Post-construction	Heritage Consultant Certifier	IoA Condition D22	CHMSP Section 6.1.3 ARD	Final AER
NAH11	A UFP is to be implemented for the life of the Project to manage the unanticipated identification of relics.	Pre-construction Construction	Environmental Manager Project Manager	EIS Measure 16(a) IoA Condition B14(c) IoA Condition C29	CHMSP Section 6.1.5 CHMSP Appendix TBC	UFP

ID	Measure / Requirement	Stage	Responsible Party	Reference	Relevant Internal Documents	Evidence of Implementation
NAH12	In the event that unexpected archaeological relics are identified by archaeological investigations, notify Heritage NSW and determine whether the relic can be avoided by a change in construction plans or whether further archaeological excavations are required.	Pre-construction Construction	Heritage Consultant Environmental Manager Project Manager	EIS Measure 15(a)	CHMSP Section 6.1.5 CHMSP Appendix TBC	Letter report
NAH13	In the event that unexpected archaeological relics are identified during works associated with the Project, notice is to be provided to Heritage NSW and the Planning Secretery. Dependant on the nature and significance of the archaeological material, an Archaeological Assessment and Management Strategy (AA&MS) may need to be prepared in consultation with Heritage NSW	Construction	Project Manager Environmental Manager Heritage Consultant	IoA Condition C29(a) & (b)	CHMSP Section 6.1.5 CHMSP Appendix TBC	Letter Report AA&MS
NAH14	Following the identification of an unexpected archaeological relic, work may only recommence following receipt of the written approval of the Planning Secretery.	Construction	Heritage Consultant	IoA Condition C29(c)	CHMSP Section 6.1.5 CHMSP Appendix TBC	Letter Report

7 COMPLIANCE MANAGEMENT

7.1 ROLES AND RESPONSIBILITIES

The Project organisational structure and overall roles and environmental responsibilities are outlined in Section 5.3 of the CEMP. Specific tasks and responsibilities for the Heritage Consultant to ensure implementation of heritage management strategies are detailed in Section 6 and Table 6.1 of this Plan.

All works undertaken by the Heritage Consultant will be carried out by a suitably qualified experienced heritage specialist.

7.2 TRAINING

All employees, contractors and utility staff working on site are to receive non-Aboriginal Cultural Heritage Awareness Training in the form of an induction before they begin work on site. This training will address obligations under the Project IoA, the Heritage Act, and project specific site identification, heritage conservation and management measures. Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in heritage management. Further details regarding staff induction and training are outlined in Section 5.1 of the CEMP.

7.3 MONITORING AND INSPECTION

The Project Manager of the Construction Contractor will conduct regular inspections of sensitive areas, exclusion zones and activities with the potential to impact non-Aboriginal Heritage for the duration of the Project. Issues will be recorded and raised with either the Heritage Consultant or the relevant authorities.

7.4 AUDITS

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub plan and other relevant approvals, licenses and guidelines.

Cultural heritage should be included within any environmental audit of impacts undertaken during the construction phase.

Audit requirements are detailed in Section 6.2 of the CEMP.

7.5 REPORTING

Reporting requirements and responsibilities are documented in Section 6 of the CEMP.

8 REVIEW AND IMPROVEMENT

8.1 CONTINUOUS IMPROVEMENT

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will:

- Identify areas of opportunity for improvement of environmental management and performance;
- Determine the cause or causes of non-conformances and deficiencies;
- Develop and implement a plan of corrective and preventative action to address any nonconformances and deficiencies;
- Verify the effectiveness of the corrective and preventative actions;
- Document any changes in procedures resulting from process improvement; and,
- Make comparisons with objectives and targets.

8.2 CHMSP UPDATE AND AMENDMENT

This HMP will need to be revised whenever the construction program, scope of work, or work methods change, whenever the work methods and control structures are found to be ineffective, based on the results of subsequent phases of archaeological or built heritage documentary work, or if so directed by the Principal. This will occur as needed and in accordance with the process outlined in Section 6 of the CEMP.

9 REFERENCES

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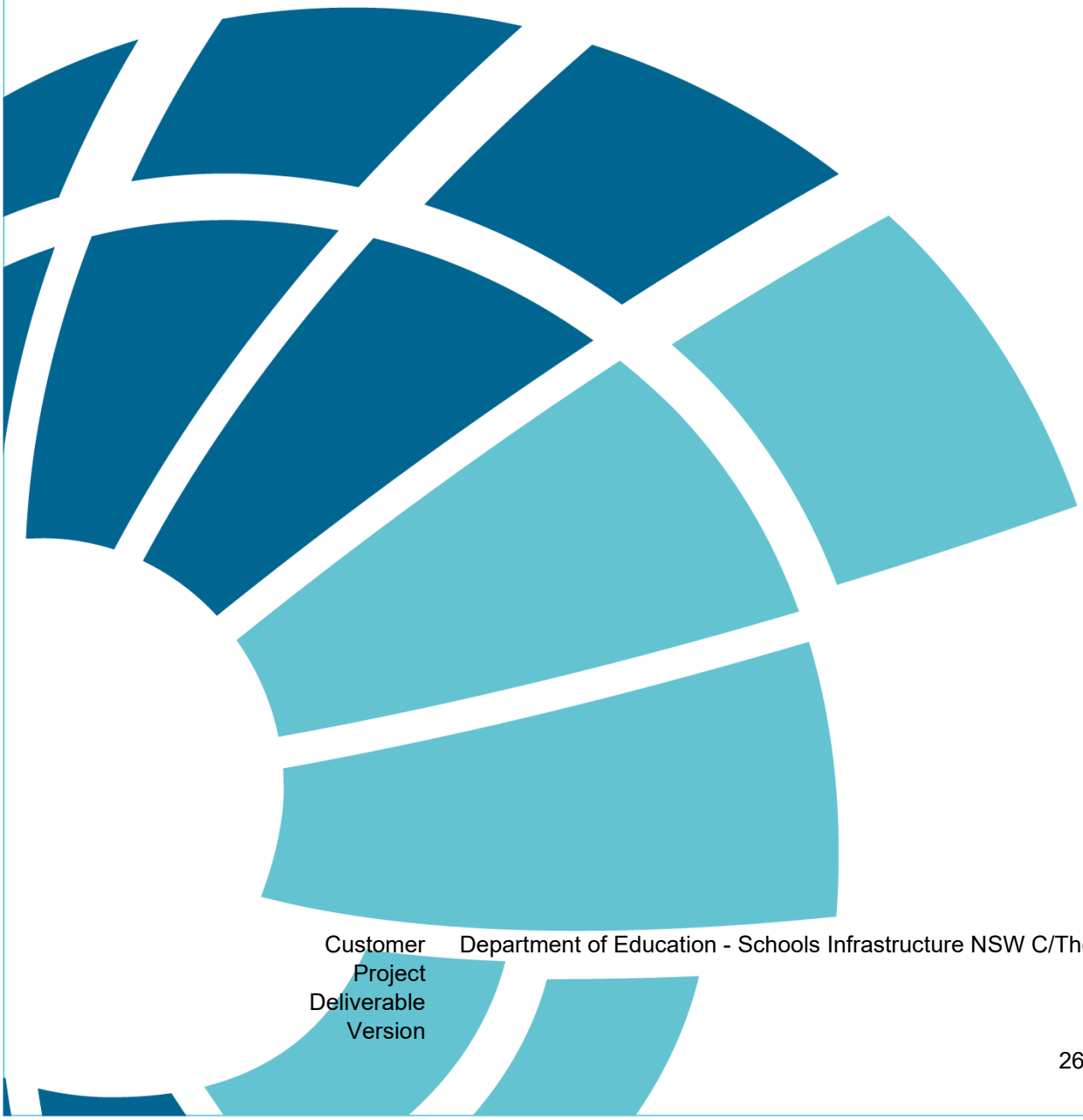
A.11 Construction Flood Emergency Management Plan

Construction Flood Emergency Management Plan Newcastle Education Campus



Customer	Department of Education - Schools Infrastructure NSW C/The App Group
Project	A12077
Deliverable	002
Version	01
	26 March 2024

Document Control

Document Identification

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Project No	A12077
Deliverable No	002
Version No	01
Version Date	26 March 2024
Customer	Department of Education - Schools Infrastructure NSW C/The App Group
Customer Contact	Anthony Harrigan
Classification	BMT (OFFICIAL)
Synopsis	Construction Flood Emergency Management Plan to inform the development of the Newcastle Education Campus
Author	Barry Rodgers
Reviewed By	Owen de Jong
Project Manager	Barry Rodgers

Amendment Record

The Amendment Record below records the history and issue status of this document.

Version	Version Date	Distribution	Record
00	14 March 2024	The App Group	Draft Report
01	26 March 2024	The App Group	Final Report

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1 Introduction

1.1 Background

On 12 January 2024, Development Application SSD-41814831 for staged upgrades to Newcastle Education Campus was approved by the NSW Minister for Planning and Public Spaces. Newcastle Education Campus ("the Site") is located at 25A National Park Street, Newcastle West NSW 2302 (formerly Newcastle Education Precinct, Lot 1 DP794827, Lot 1 DP575171 and Lot 1 DP 150725).

The planning approval is subject to conditions set out within Schedule 2 of the notification of approval. Condition B21 relates to the preparation of a Construction Flood Emergency Management Plan (CFEMP). The full text of condition B21 is provided below and the section reference to this report where each part of the condition has been addressed is shown in bold text.

Construction Flood Emergency Management Plan

Prior to the commencement of each construction stage, a Construction Flood Emergency Management Plan must be prepared by a suitably qualified and experienced person(s) in consultation with NSW State Emergency Services, submitted to the Certifier and a copy to the Planning Secretary for information, including but not limited to:

*(a) Detail on triggers, including rainfall and water level, that require closure of the site; (***Section 2.2***)*
*(b) Detail on how site closure would be communicated to construction workers, before commencement of the work day; (***Section 2.3***)*
*(c) Details of drills, frequency and record management of the drills; (***Section 2.4***)*
*(d) A map showing the flood-free pedestrian route from each construction site to a suitable location free of inundation; (***Section 2.5***)*
*(e) Details of any gauges or warning infrastructure that are to be provided to assist with flood management, including frequency of maintenance, and how these will be monitored; (***Section 2.6***)*
*(f) Identification of suitable locations for evacuation that are free of inundation; (***Section 2.7***) and*
*(g) Flood warning signs around the site to identify areas with Category H3 hazard and higher, in accordance with the Flood Hazard Flood Risk Management Guide FB03, NSW Department of Planning and Environment and are within the overland flow path. (***Section 2.8***)*

The APP Group has engaged BMT to prepare the CFEMP and this is set out within this report. The CFEMP has been prepared by Barry Rodgers of BMT and reviewed by Owen de Jong of BMT. CV's of Barry and Owen are provided in Annex A.

1.2 Supporting Information

The CFEMP draws upon information presented in two reports previously prepared by BMT as part of the planning application for the Site. These reports are as follows:

- Flood Impact Assessment (FIA) which describes the flood behaviour at the Site and assesses the potential for flood impacts as a result of the proposed development. Proposed floor levels are also provided and demonstrate that they are above the flood planning level (reference: R.A12077.001.02_FIA).

- Flood Emergency Response Plan (FERP) which outlines the proposed strategy for flood emergency management of the Site including the nomination of evacuation routes. The report documents available space for sheltering in place, including for four interim stages of construction (reference: R.A12077.001.07_FERP).

The CFEMP contains only summary details from these two reports and reference should be made to those reports for further information if required.

1.3 Consultation with SES

The NSW State Emergency Service (SES) was consulted during preparation of the FERP and was satisfied that its advice was incorporated into the finalised FERP. In summary, the SES states that the preferred emergency strategy for the school is early closure prior to the commencement of flooding and before the start of the school day. People using the site must be informed of the flood risk during and after the works, for example by using signage, induction etc.

Given the significant overlap between the FERP and this CFEMP and that the SES advice received also related to the construction stages of the development, it is considered that the received SES advice remains applicable for the CFEMP. A draft version of the CFEMP was provided to the SES for review and they concurred that their recommendations for the FERP are also reflected in the CFEMP. A copy of the SES response to the CFERP is provided in Annex B.

2 Construction Flood Emergency Management Plan

2.1 Overview

A CFEMP has been prepared to address the requirements of condition B21. A key consideration when preparing the CFEMP is that the majority of the Site remains outside of the flood extent for events up to and including the 0.5% AEP event. As such, the likelihood of the Site flooding, particularly during the relatively short construction period (around 2 years) is low. Notwithstanding this, a precautionary approach is applied whereby early evacuation is undertaken when a significant weather event is forecast.

The CFMEP is structured in accordance with the sub-items of B21 and is set out below.

2.2 Triggers for Site Closure

The Site is located within the Cottage Creek catchment and has the potential to be impacted by runoff from a small 110 hectare upstream area. There are no upstream water level gauges and any triggers based on rain which has fallen at nearby rain gauges may not give sufficient time to evacuate.

It is proposed that the NSW Hazards Near Me app is monitored for warnings of extreme weather. This includes severe weather warnings and severe thunderstorm warnings issued by the Bureau of Meteorology and which may include warnings for possible flash flooding. These warnings are also disseminated via various media outlets and are available of the Bureau of Meteorology website. In the event of a local warning advising of the potential for flash flooding it is recommended that the Site is closed and evacuated.

Whereas much of the Site is located at an elevation above 4mAHD, a small proportion of the Site in the north east corner is at lower elevations typically ranging between 2.1 to 2.5 mAHD. In addition to monitoring for severe weather warnings, it is recommended that the site is evacuated if water within Cottage Creek starts to rise and spread over the majority of this lower part of the Site i.e. a flood level of around 2.5mAHD. A flood depth indicator is proposed in this location which will mark a flood height corresponding to 2.5mAHD (see Section 2.6).

2.3 Communication of Site Closure

In the event of Site closure, a safety bulletin should be sent to all workers. BMT understands this can be delivered through the contractor's safety management software, Hammertech. Each worker associated with the project should then receive an SMS with information relating to Site closure.

For workers on site, a nominated worker should assume the role of chief flood warden. In the event of a Site closure, this worker should ensure that the Site is fully evacuated.

2.4 Flood Evacuation Drills

All site workers should be made aware of the potential flood risk to the site during Site induction. This should include awareness of evacuation routes and areas of the Site where floodwater can potentially pose the greatest hazard, namely the eastern corner near the proposed multi-purpose facility. The induction should also make workers aware of suitable buildings where shelter in place can occur in the unlikely event that evacuation is not possible (see Section 2.5).

It is recommended that a flood evacuation drill for site workers is undertaken on an annual basis. The drill should assume that a severe weather warning has indicated the potential for flash flooding and that the water level in Cottage Creek is rising rapidly. An evacuation to nominated shelter in place locations should be undertaken as part of the drill using nominated routes.

The school will still be operating during the construction stages. It is assumed the requirement for a flood evacuation drill in the CFEMP relates only to construction activities and workers. The students and teachers of the school would not be expected to take part in these drills as they have their own flood emergency management plan.

2.5 Flood Free Pedestrian Evacuation Routes

Evacuation routes to shelter in place locations are presented in the FERP. Annex C of this report presents figures showing flood free pedestrian routes to an area north of Building A for all key stages of construction. If floodwater continues to rise and shelter in place is required then Figure 2.1 shows flood free evacuation routes to shelter in place locations within Building A. Building A is the nominated shelter in place location for workers during all stages of construction as it retains sufficient floor area above the PMF flood level for all construction stages. It is recommended that use of Building A for potential shelter in place for workers is discussed and agreed with the school.

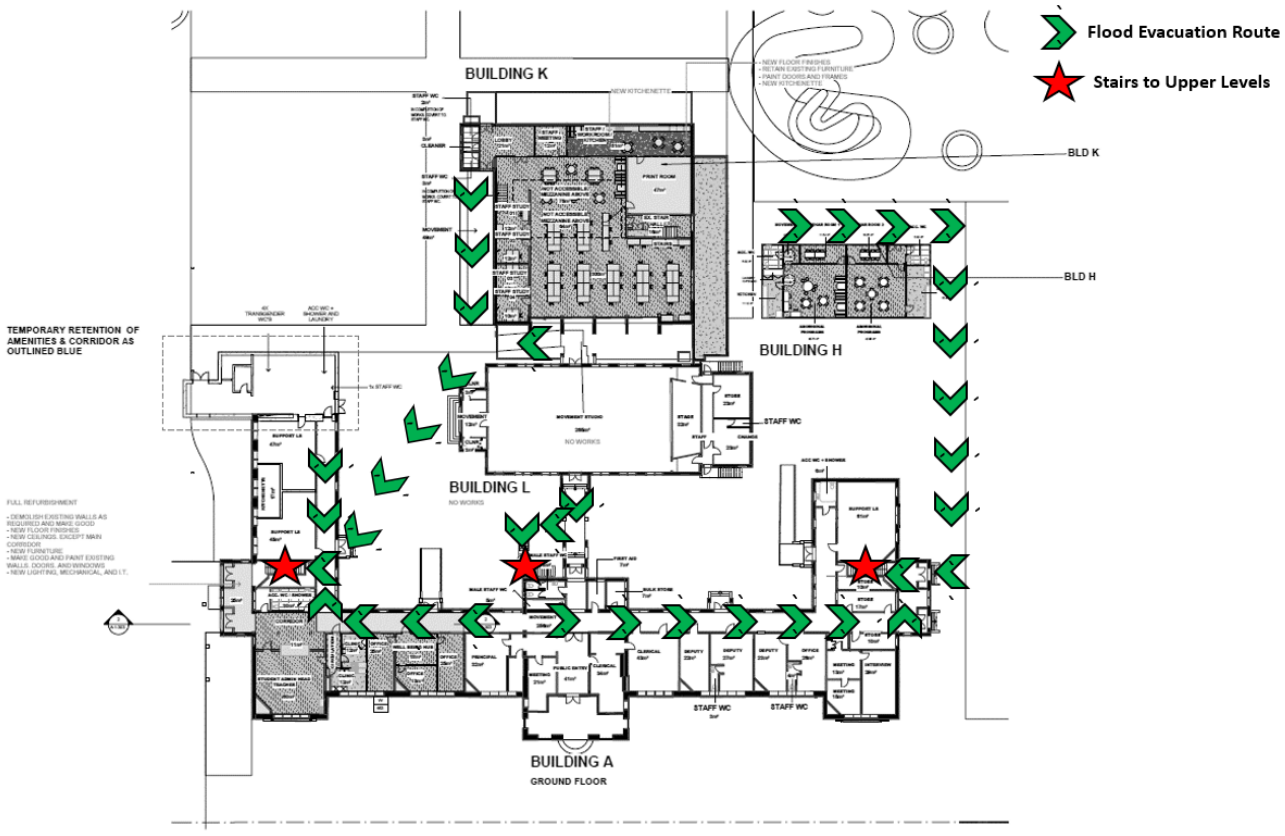


Figure 2.1 Evacuation routes to shelter in place in Building A

2.6 Gauges and Flood Warning Infrastructure

Given the nature of the flooding that has the potential to affect the site is flash flooding, there is limited potential to provide advance warning from installation of gauges within the catchment. A recommendation of the FERP was to install a flood depth indicator in the area north of the proposed multipurpose facility building with indicators for the 5% AEP flood level (2.48mAHD) and the 1% AEP flood level (2.94mAHD). This gauge can be used to monitor the rate of rise of floodwater at the site and can be used to set key triggers as part of an evacuation response.

It is assumed that the gauge would be a manually read gauge with clear markers identifying flood depths and key thresholds. Maintenance of the gauge is expected to be relatively minimal but it should be checked and cleaned after any period of floodwater inundation and retained free of debris.

An example flood depth marker is shown in Figure 2.2. Elevations of the 5% AEP (2.48mAHD) and 1% AEP (2.94mAHD) design floods would need to be determined as a height on the board and indicated with alternative marking.

Figure 2.2
Example Flood Depth Indicator Board

2.7 Suitable locations for Evacuation

The majority of the Site is free from inundation in all modelled events up to and including the 0.5% AEP flood. In the PMF event the entire Site and much of the surrounding area is inundated and so suitable locations for evacuation are limited to internal floor areas of buildings which have floor levels above the PMF level. The FERP identifies these floor areas during each key construction stage and this information is replicated in Figure 2.3 below. The analysis conservatively assumed that the school is at capacity with students and teachers and that these are factored into the calculations. As stated in Section 2.5, it is recommended that Building A is the nominated shelter in place location for workers during all stages of construction as it retains sufficient floor area above the PMF flood level for all construction stages. The newly constructed buildings (New Learning Hub and Multipurpose Facility) will also have floor levels above the PMF level at the end of Stages 2 and 3 and these buildings will be finished during Stages 4 and 5.

STAGE 1	
-Move Building H to new location	
- Services Infrastructure Upgrades	
- Demolition of Building B and existing Sport Courts	
- Remove trees, other planting	
Site Occupants	1242 ppl
Building A - Level 1	969 m²
Building B - Level 1	60 m² (maintained after demolition)
Building C - Level 1	673 m²
Building C - Level 2	687 m²
Building D - Level 1	377 m²
Building D - Level 2	371 m²
Total Available area	**3137 m²**
Per-capita available space (ppl/m²)	**2.53**

STAGES 2 and 3 (occurring concurrently)	
- Construction of new Learning Hub (Building R)	
- Landscaping walkway and external works	
-New Support drop off zone	
- Construction of newMultipurpose Facility (Building S)	
- Landscaping and external works	
- Demolish Building P	
Site Occupants	1242 ppl
Building A - Level 1	969 m²
Building B - Level 1	60 m² (maintained after demolition)
Building C - Level 1	673 m²
Building C - Level 2	687 m²
Building D - Level 1	377 m²
Building D - Level 2	371 m²
Building R - Level 1	0 m² (construction in progress)
Building R - Level 2	0 m² (construction in progress)
Building S - Level 1	0 m² (construction in progress)
Total Available area	**3137 m²**
Per-capita available space (ppl/m²)	**2.53**

STAGE 4	
- Refurbish Building A & K	
- Demolish Building J & existing walkways to Building K	
- Landscaping , site works	
Site Occupants	1242 ppl
Building A - Level 1	969 m²
Building B - Level 1	60 m² (maintained after demolition)
Building C - Level 1	673 m²
Building C - Level 2	687 m²
Building D - Level 1	377 m²
Building D - Level 2	371 m²
Building R - Level 1	2069 m²
Building R - Level 2	1975 m²
Building S - Level 1	900 m²
Total Available area	**8081 m²**
Per-capita available space (ppl/m²)	**6.51**

STAGE 5 and Project Completion	
- Demolish Buildings D, E & I	
- Construct new Sports Courts	
- Landscaping , site works	
- Campus Green & remaining landscapes, walkways	
Site Occupants	1530 ppl
Building A - Level 1	969 m²
Building B - Level 1	60 m² (maintained after demolition)
Building C - Level 1	673 m²
Building C - Level 2	687 m²
Building D - Level 1	0 m² (demolition in progress)
Building D - Level 2	0 m² (demolition in progress)
Building R - Level 1	2069 m²
Building R - Level 2	1975 m²
Building S - Level 1	900 m²
Total Available area	**7333 m²**
Per-capita available space (ppl/m²)	**4.79**

Figure 2.3 Available area for sheltering in place during a PMF event in project construction stages

2.8 Signage for High Hazard Areas

Pre-construction condition B21 (g) requests that flood hazard is identified for hazard category H3 and above using the Flood Hazard Flod Risk Management Guideline FB03 and that flood warning signs are placed around the Site to identify such areas which also correspond to overland flow paths.

The FIA identified and categorised flood hazard in accordance with Newcastle City Council's DCP. This consisted of five categories of hazard termed 'hydraulic behaviour thresholds'. Guideline FB03 uses a different categorisation consisting of six categories of increasing hazard as shown in Figure 2.4.

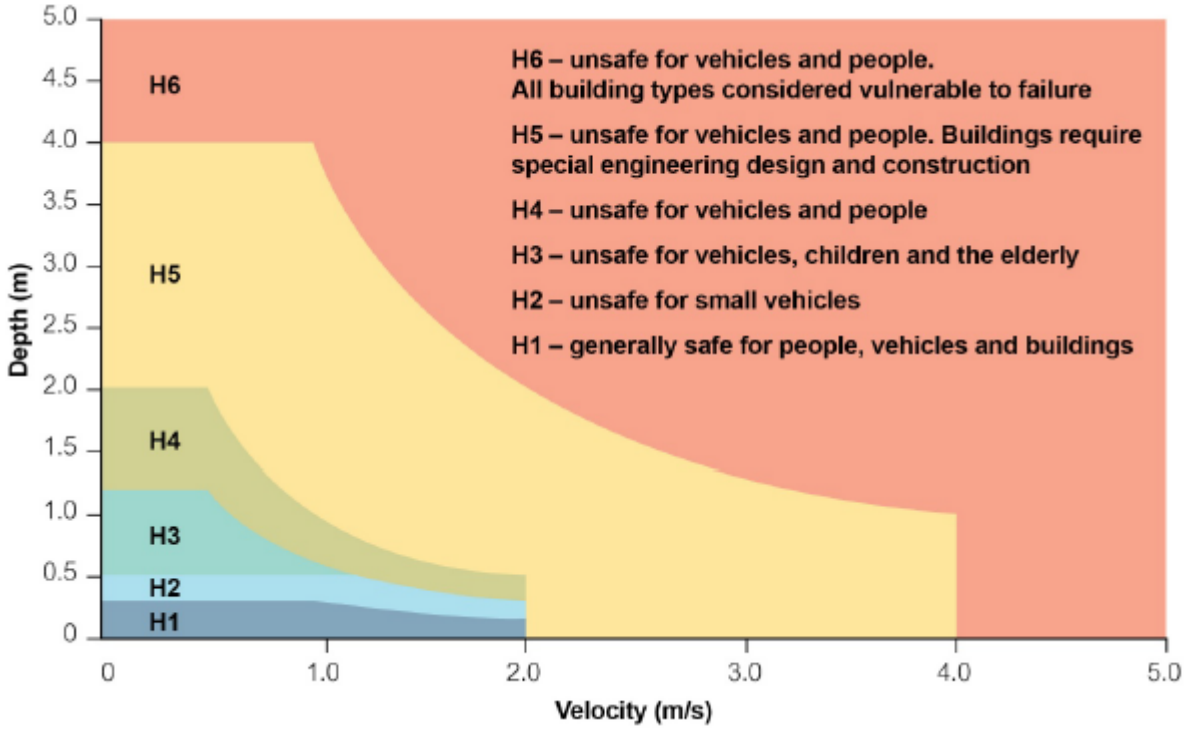


Figure 2.4 General Flood Hazard Vulnerability Curves specified in FB03

The FB03 hazard categories are based on combinations of flood depth and flood velocity. Hazard category 3 and above includes all areas with a depth above 0.5m. If the velocity exceeds 1m/s then the depth threshold for Hazard Category 3 or more is reduced.

Figure 2.5 shows the hazard categories H3 and above mapped across the Site for a PMF. All areas of the Site, apart from existing buildings, are subject to category H3 and above. The pattern of inundation during the PMF event is caused by water rising from Cottage Creek and backing up into the Site. As such the inundation has relatively low velocity and there are no areas that are considered overland flow paths where water flows through the Site. An extract from the peak flood velocity mapping for the PMF event is shown in Figure 2.6 for both the pre- and post- developed cases. It can be seen that velocities within the Site are relatively low and no overland flow paths are apparent.

The condition requests that signage is placed in areas both where it is subject to hazard H3 and above and it is within an overland flow path. No parts of the Site meet the conditions needed for this requirement. Notwithstanding this, it is recognised that the eastern corner of the Site has the potential for high flood hazard (up to H5) due to the potential for significant flood depths during a PMF event, and lower flood depths during more frequent events. It is therefore recommended that signage be included alongside the proposed flood depth indicator to indicate the potential for inundation. A location for the recommended sign is included in Figure 2.6 and an example sign is shown in Figure 2.7.

Figure 2.5 Flood Hazard Categories H3 or greater shown across the Site

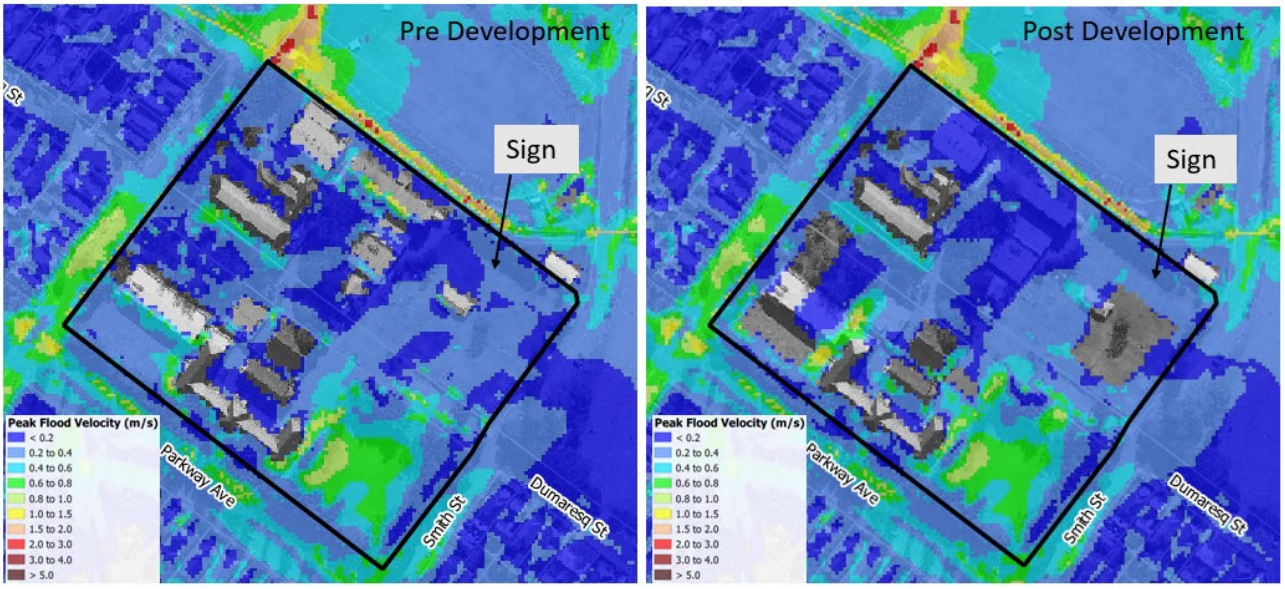


Figure 2.6 Peak PMF Velocity and recommended location for flood hazard signage

Figure 2.7 Example Signage for Eastern Part of Site

3 Conclusions

A Construction Flood Emergency Management Plan (CFEMP) is presented for the proposed Newcastle Education Campus upgrades. The CFEMP addresses the requirements of pre-construction condition B21 and is informed from analyses undertaken in the supporting flood impact assessment and flood emergency response plan. The SES was provided with a draft copy of the CFEMP and noted that it's previous recommendations are reflected in the CFEMP.

The preferred strategy during an extreme weather event is early Site closure based on monitoring for flash flood warnings and water levels in lower parts of the Site. Should a sudden and severe rainfall event happen while workers are already on the Site then a shelter in place strategy is advised using Building A.

The CFEMP presented in this report is based on construction staging details available at the time of reporting and use of simulated design floods. In reality, flood events can have characteristics different from those simulated and therefore the flood behaviour presented in this report should be considered indicative only of what can occur.

It is recommended that the CFEMP is reviewed on an annual basis.

Annex A CVs

Barry Rodgers

CAREER OVERVIEW

Barry joined the BMT flood team in Brisbane in January 2011. He has a Master's degree in hydrology and over 19 years of consultancy experience in Australia and overseas specialising in hydrologic and hydraulic modelling.

He was the lead hydraulic modeller in developing a 2D hydraulic model of the Brisbane River Catchment; one of the largest and most comprehensive studies of its kind in Australia and one that won and Engineers Australia award for technical excellence. He was also the technical lead on a number of other high profile studies including the Swan River Flood Study, the Maroochy River Flood Study Update, the Richmond River Flood Study and the Ipswich Rivers Flood Study update, the latter being one of the first in the country to apply Australian Rainfall and Runoff 2019 techniques at the catchment scale. Barry regularly undertakes technical peer reviews of modelling studies for internal and external clients.

POSITION

Principal Scientist

YEARS OF EXPERIENCE

20

ACADEMIC QUALIFICATIONS

MSc in Hydrology and Water Quality from Lancaster University UK (2004)

BSc in Environmental Science from University of Southampton UK (2001)

EMPLOYMENT HISTORY

2011 to date **Principal Scientist, BMT**

2007 to 2011 **Consultant, Senior Consultant, Entec UK Ltd, Bristol UK**

2004 to 2007 **Assistant Analyst, Analyst, JBA Consulting, Warrington UK**

PROFESSIONAL AFFILIATIONS

- Chartered Institute of Water and Environmental Management, Member (MCIWEM)
- Chartered Scientist (CSci)

FLAGSHIP PROJECT

Brisbane River Flood Study Hydraulic Assessment – Barry was the lead flood modeller in developing a 2D model of the lower Brisbane River. The model was calibrated to a range of flood events and resulted in some key findings in relation to use of supplementary energy losses that were since presented to the industry. The study subsequently won the Engineers Australia RJ Hawkin Award for Engineering Excellence.

AREAS OF EXPERTISE

- Hydrologic Modelling
- Hydraulic Modelling
- Project Management
- Peer Reviews

SPECIFIC PROJECTS

Strategic/Catchment Scale Flood Studies

- Maroochy Flood Mitigation, Sunshine Coast Regional Council (2023-ongoing)
- Clarence Valley Flood Mitigation, Department of Planning and Environment (2023 - ongoing)
- Lower Clarence Flood Model Update, Clarence Valley Council (2021-2023)
- Richmond Valley Flood Study, Richmond Valley Council (2021-2023)
- Lower Clarence River Structural Flood Mitigation Works Investigation, Clarence Valley Council (2020-2022)
- Kapiti Coast District Council, New Zealand - Hydraulic Model Peer Reviews (2020-2022)
- City of Canterbury-Bankstown Urban Drainage Assessments (Various) (2013-2020)
- Insurance Australia Group – Flood Investigations (2013-2020)
- Pioneer River Flood Study Peer Review - Mackay Regional Council (2019)
- New Grafton Bridge Flood Modelling and Mitigation (2015-2019)
- Levee Regulation Framework Scoping Study and Review (2018)
- Ipswich Rivers Flood Study Update (2017-2018)
- Swan and Helena Rivers Flood Study (2016-2017)
- Brisbane River Catchment Flood Study (2014-2017)
- Evans River Flood Study, Richmond River County Council (2014)
- Grafton Bridge – Additional Crossing of the Clarence River at Grafton – Hydraulic Impact Assessment, Roads and Maritime Services (2014)
- Bankstown LGA Wide Piped Network Constraints Analysis, Bankstown City Council (2014)
- Black Snake Creek Flood Investigations, Ipswich City Council (2014)
- Bankstown Stormwater Modelling and Mapping, Bankstown City Council (2013)
- Western Downs Flood Risk Management Study, Western Downs Regional Council (2013)
- Western Downs Flood Study – Peer Review, Western Downs Regional Council (2012)
- CopperString Transmission Line, Leighton Contractors (2011)

Site Specific Assessments

- Singleton Bypass Subject Matter Expert - Flooding, Transport for NSW (2022-ongoing)
- Department of Transport and Main Roads, Butterfield St. Bus Layover Business Case Assessment (2020)
- Transport for NSW, Lismore Road Upgrade Flood Modelling Investigation (2020)
- Glencore Hunter Valley Operations, Peer Review of Flood Modelling (2020)
- West Yamba Flood Impact Assessment (Various) (2014-2019)
- Bennett Street Drain Options Assessment, Bankstown City Council (2015)
- Norman Creek Bikeway Crossing, Brisbane City Council (2014)
- Summerland Way Flood Impact Assessment, Roads and Maritime Services (2014)
- Wryallah Road Flood Impact Assessment, Lismore City Council (2014)

KEY PAPERS/PRESENTATIONS

Richmond Valley Flood Study - An Overview, presented at the Queensland Water Symposium 2023.

A Multi-Criteria Investigation of Structural Flood Mitigation Assets in the Clarence Valley Floodplain, presented at the Floodplain Management Australia 2022 National Conference, Toowoomba, May 2022.

Ipswich Rivers Flood Study Update – Implementing ARR2016 at the catchment scale, presented at Engineers Australia Evening Event, Brisbane, June 2018.

Swan River: A Pragmatic Assessment of the Interaction of Riverine and Coastal Flooding, presented at the Floodplain Management Australia 2018 Conference, Gold Coast, May 2018.

'Brisbane River Catchment Flood Study – Hydraulic Modelling Overview' presented at the Queensland Water Panel Special Event, Engineers Australia, Brisbane, September 2017.

'Brisbane River Catchment Flood Study – Calibration of Hydraulic Models' presented at 13th Hydraulics in Water Engineering Conference, Sydney, November 2017.

Owen de Jong

CAREER OVERVIEW

Owen is an Environmental Engineer and Scientist (CPEng / RPEQ) with 18 years of experience in water engineering and infrastructure across local government, state government and private sectors. Surface water management has been a particular focus, with specific areas of expertise encompassing catchment wide flood studies, floodplain risk management plans, concept and detailed designs, hydrology and flooding for major road and rail infrastructure, dam break assessments, stormwater quality, drainage, stormwater harvesting, water balance, erosion and sediment control, climate change assessments, riparian assessments and policy review.

Other experience includes authoring and presenting papers relating to water engineering, university lecturing, hosting of technical tours and community consultation.

POSITION

Principal Engineer

EMPLOYMENT HISTORY

2022 to date **Principal Engineer, BMT**

2020 to 2022 **Various, Contract Roles**

- Principal Engineer, AECOM
- Flooding+Stormwater Unit Leader (Acting), Wollongong City Council
- Dams Engineer, Wollongong City Council
- Technical Specialist, Transport for NSW

2016 to 2019 **Senior Natural Resources Officer (Floodplain Management), NSW Department of Planning, Industry & Environment**

2010 to 2016 **Manager (Water), Cardno**

2007 to 2010 **Water Engineer, Parsons Brinckerhoff**

2007 to 2007 **Graduate Water Engineer, Brown Consulting**

2005 to 2007 **Undergraduate Water Engineer, Redland Water & Waste**

ACADEMIC QUALIFICATIONS

B.Eng (Hons1) in Environmental Engineering from Griffith University (2006)

B.Sc from Griffith University (2006)

YEARS OF EXPERIENCE

19

PROFESSIONAL AFFILIATIONS

- Member, Institution of Engineers Australia (MIEAust)
- Chartered Practicing Engineer (CPEng)
- Registered Professional Engineer of Queensland (RPEQ)

AREAS OF EXPERTISE

- Catchment hydrology
- Floodplain risk management
- Dams safety management
- Transport infrastructure
- Drainage & water quality
- Erosion & sediment control

AWARDS

Certificate of Appreciation for Contributions to Teaching and Learning at the University of Wollongong, 2018 & 2019.

Best for Project, Albion Park Rail Bypass (Hydrology & Flooding Lead), 2014.

SPECIFIC PROJECTS

Floodplain Management

- Rockhampton Floodplain Risk Management Study (2023-2024)
- NSW Floodplain Management Program, Flood and Risk Management Studies - Technical Assistance for 19 Catchment Wide Studies and Plans (2016-2019)
- NSW Floodplain Management Program, Flood Mitigation Works - Technical Assistance for Investigation & Design of 11 Flood Mitigation Projects. (2016-2019)
- Nowra & Browns Creeks Floodplain Risk Management Study & Plan (2012-2014)

Dams Safety Management

- Review of Logan City Council LGIP Stormwater Basins (2023)
- Wollongong City Council Dams Safety Management System (2021)
- Shell Cove Estate Detention Basin 1 DBA, DSEP and OMM (2015)
- Shellharbour City Centre Basin DBA, DSEP and OMM (2012-2014)

Erosion & Sediment Control

- Veolia Water Soil & Water Management Plan (2014)
- Dargues Gold Mine Pollution Production Program (2013)
- Wongawilli No.2 Ventilation Shaft Project (2011)
- Anglo American Metallurgical Coal (2010)

Flood Impacts & Mitigation

- Northern Silica Project (2023-2024)
- Gladstone Solar Farms (2023-2024)
- Damascus Barracks Zone B (2022)
- Corrimal Schools (2012-2016)
- Innovation Campus (2011-2016)
- University of Wollongong Stormwater & Flooding Rectification Works (2015)
- BlueScope CRM (2014-2014)
- Elderslie Release Area (2013-2014)
- Kembla Grange Employment Lands Flood Study (2014)
- Wollongong Debris Control Structures (2014)

Policy

- NSW Floodplain Management Program, Input for Various Local and State Government Policies (2016-2019)
- Shellharbour Floodplain Risk Management DCP Review (2011-2013)

Expert & Insurance

- ANU (2023)
- Capricorn Copper (2023)
- Ernest Henry Mine (2023)
- United Cinemas (2023)
- Cleanaway New Chum (2023)
- Blackbutt (2013)
- Warilla (2011)

Transport Infrastructure

- Swan Hill Bridge Replacement (2023)
- Gold Coast Light Rail Stage 3 (2022)
- Pacify Motorway Upgrade, Palm Beach to Tugun (2022)
- Inland Freight Route Link (2022)
- Albion Park Rail Bypass (2014-2021)
- Berry to Bomaderry Upgrade (2015-2016)
- Fowlers Road to Fairwater Drive (2014-2016)
- Cleveland Road Upgrade (2016)

Water Cycle Management

- Bunnings Bellambi (2015-2016)
- University of Wollongong (2013-2014)
- McPhails Urban Development (2011-2014)
- Wongawilli Urban Development (2010-2014)

Water Quality

- Inland Rail (2022)
- Shellharbour Regional GPT Designs (2013-2016)
- Shell Cove Wetlands (2011-2013)
- Port Kembla Coal Terminal (PKCT) (2012)
- Hanrahan Refuse Site (2012)

ARTICLES, PAPERS, PRESENTATIONS

Dams Safety Management System Workshop for Wollongong City Council. Authored and presented by Owen de Jong.

Ghetti, I, de Jong, O, Garratt, O & Nunn, P, 2019, 'Cooking up ARR16 Storms in Wollongong – the Importance of Using Local Ingredients'. Presented by Isabelle Ghetti at FMA 2019 Conference, Canberra, ACT.

Guest lecturer at University of Wollongong for Water

ARTICLES, PAPERS, PRESENTATIONS, CONTINUED...

Sensitive Urban Design (WSUD), host of WSUD technical tours and water quality modelling tutorials (2014 to 2019).

Host of World Wetlands Day 2018 at Shell Cove Wetlands (featured on WIN News).

de Jong, O, 2011, ‘Major Flood of March 2011: 1 in 100 year Wipeout for Warilla’. Presented by Owen de Jong at SIA NSW 2011 Conference, Hunter Valley, NSW.

Annex B SES Response to CFEMP

Our Ref: ID2354
Your Ref: SSD-41814831

22 March 2024

Soane Puliuvea
The App Group
Level 2, 426 King Street
Newcastle West NSW 2302

email: Soane.Puliuvea@app.com.au
CC: lisa.ignatavicius1@ses.nsw.gov.au

Dear Soane,

Construction Flood Emergency Response Plan for Newcastle Education Campus Site

Thank you for the opportunity to provide comment on the Construction Flood Emergency Response Plan (CFERP) for the proposed development at Newcastle Education Campus. It is understood that this project, a state significant development (SSD-41814831), includes the construction of a new three-story learning hub, a multipurpose hall, and the demolition of certain existing structures.

We refer to our previous correspondences dated 1 March 2023 (FERP), 2 August 2023 (EIS), 20 November 2023 (RtS) and appreciated that BMT have incorporated the NSW SES recommendations in the Flood Emergency Response Plan (FERP) accordingly. These recommendations are also reflected in the CFERP.

The NSW SES has reviewed the CFERP and the flood risk information (e.g. Newcastle Local Flood Plan; Newcastle City Wide Floodplain Management Study and Plan 2012; Council's Flood Certificate; Thorsby, Cottage and CBD Flood Study 2008; Honeysuckle Redevelopment Area Flood Study 2018; the Flood Impact Assessment provided) available to the NSW SES, noting the proposed development is at risk of flooding and the adjacent roads may be cut by floodwaters.

We would like to emphasise:

- It is the preference of NSW SES that all schools follow the application of sound land use planning and flood risk management in accordance with the Flood Prone Land Policy, the Flood Risk Management Manual 2023 (the Manual) and supporting guidelines.
- NSW SES does not have the authority to endorse or approve the private CFERP.
- The CFERP must be regularly exercised, reviewed, and updated to ensure workers are aware of the procedure and that it remains current and relevant and ensure

consistency with the contemporary emergency management arrangements relevant to the area, for example the Newcastle City Local Flood Emergency Sub Plan.
- It is the preferred emergency strategy for the school site is early closure prior to the commencement of flooding and before the start of the school day.

In 2023 the NSW SES implemented the Hazards Near Me app, to warn communities about floods, severe weather, and tsunami. Making warnings easier to access during weather events enables the school community to make safer decisions, which is part of our mission to create safer communities. In addition, we recommend the CFERP also:

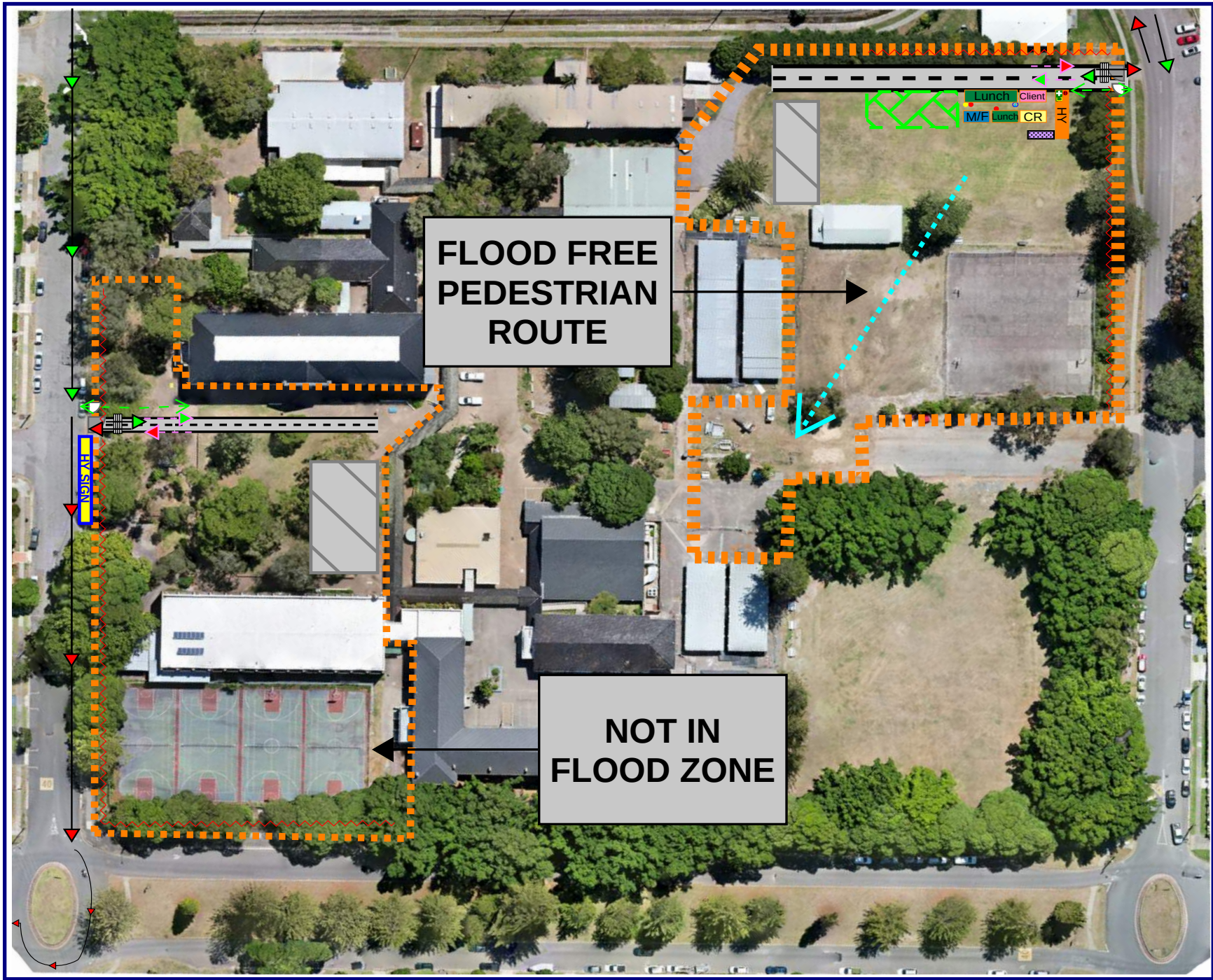
- Integrate the Hazards Near Me NSW App into the CFERP and FERP for emergency information. School closure will need to be proactive and not rely on receipt of any warnings provided by NSW SES.
- Educate occupants about the Australian Warning System Warning Level (Emergency Warning, Watch and Act, Advice) definition and the implications for the Flood Emergency Response Plan.

Please feel free to contact Gillian Webber via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours sincerely

Gillian Webber
Coordinator Emergency Risk Management Regional
NSW State Emergency Service

Annex C Nominated Flood Free Evacuation Routes



Legend of Symbols

- External Perimeter Site Boundary (Type A Fencing)
- Vehicle Gate
- Pedestrian P/A Gate
- HY Statutory Project Site Signage Board
- Laydown Zone
- Site Emergency Evacuation Muster Point
- Internal Site Vehicle Main Path / Road
- Vehicle Access into Project Site
- Vehicle Egress out of Project Site
- Emergency Services Vehicle main Access to / Egress from Project Site
- OH&S First Aid Room with Defrib
- T(m/f) Site Toilets (m=male. f=female)
- L Site Lunchrooms
- HY Site Offices Hansen Yuncken
- CR Site Offices Hansen Yuncken
- Site Container
- Fire Fighting Equipment
- Water Point (non potable)
- Spill Kit
- Evacuation Siren Location
- Main Site Bins / resource recovery
- Site Personnel Entry / Exit / Travel Routes
- Sediment Control Fencing
- Cattle Grate

HY SITE MANAGEMENT & OHS&W PLANNING

Stage 1 Site Layout

North

Revision: 1
Rev Date: 12/02/24

160/200 Parkway Avenue, Hamilton South, NSW 2303

NEWCASTLE HIGH SCHOOL REDEVELOPMENT

HANSENYUNCKEN

Legend of Symbols

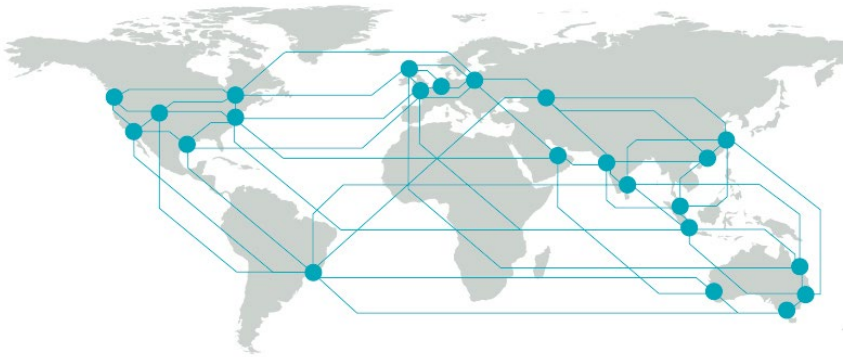
- External Perimeter Site Boundary (Type A Fencing)
- Vehicle Gate
- Pedestrian P/A Gate
- HY Statutory Project Site Signage Board
- Laydown Zone
- Site Emergency Evacuation Muster Point
- Internal Site Vehicle Main Path / Road
- Vehicle Access into Project Site
- Vehicle Egress out of Project Site
- Emergency Services Vehicle main Access to / Egress from Project Site
- OH&S First Aid Room with Defrib
- T(m/f) — Site Toilets (m=male. f=female)
- L — Site Lunchrooms
- HY — Site Offices Hansen Yuncken
- CR — Site Offices Hansen Yuncken
- Site Container
- Fire Fighting Equipment
- Water Point (non potable)
- Spill Kit
- Evacuation Siren Location
- Main Site Bins / resource recovery
- Site Personnel Entry / Exit / Travel Routes
- Sediment Control Fencing
- Cattle Grate

HY SITE MANAGEMENT & OHS&W PLANNING	Stage 2 & 3 Site Layout	North	Revision: 1 Rev Date: 12/02/24
160/200 Parkway Avenue, Hamilton South, NSW 2303	NEWCASTLE HIGH SCHOOL REDEVELOPMENT	HANSENYUNCKEN	

Legend of Symbols

- External Perimeter Site Boundary (Type A Fencing)
- Vehicle Gate
- Pedestrian P/A Gate
- HY Statutory Project Site Signage Board
- Laydown Zone
- Site Emergency Evacuation Muster Point
- Internal Site Vehicle Main Path / Road
- Vehicle Access into Project Site
- Vehicle Egress out of Project Site
- Emergency Services Vehicle main Access to / Egress from Project Site
- OH&S First Aid Room with Defrib
- T(m/f) Site Toilets (m=male. f=female)
- L Site Lunchrooms
- HY Site Offices Hansen Yuncken
- CR Site Offices Hansen Yuncken
- Site Container
- Fire Fighting Equipment
- Water Point (non potable)
- Spill Kit
- Evacuation Siren Location
- Main Site Bins / resource recovery
- Site Personnel Entry / Exit / Travel Routes
- Sediment Control Fencing
- Cattle Grate

HY SITE MANAGEMENT & OHS&W PLANNING	Stage 4 & 5 Site Layout	North	Revision: 1 Rev Date: 12/02/24
160/200 Parkway Avenue, Hamilton South, NSW 2303	NEWCASTLE HIGH SCHOOL REDEVELOPMENT	HANSENYUNCKEN	



BMT is a leading design, engineering, science and management consultancy with a reputation for engineering excellence. We are driven by a belief that things can always be better, safer, faster and more efficient. BMT is an independent organisation held in trust for its employees.

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A.12 Biodiversity Development DPE Waiver

Our ref: SSD-41814831

Mr David Lewis
Manager – Statutory Planning
School Infrastructure NSW
Level 8, 259 George Street
Sydney NSW 2000

08 June 2023

Subject: Request to waive requirement to prepare a Biodiversity Development Assessment Report under the *Biodiversity Conservation Act 2016*

Dear Mr Lewis

I refer to your correspondence received on 8 December 2022 seeking to waive the requirement to prepare a biodiversity development assessment report (BDAR) to be submitted with the State Significant Development application for the Newcastle Education Campus (SSD-41814831).

Section 7.9(2) of the Biodiversity Conservation Act 2016 (BC Act) provides the following in relation to an application for SSD:

> "*Any such application is to be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on the biodiversity values*".

The authority of the "Planning Agency Head" to determine whether a proposed development is "*not likely to have any significant impact on biodiversity values*" has been delegated to Team Leaders within the Planning and Assessment Division of the Department of Planning and Environment (the Department).

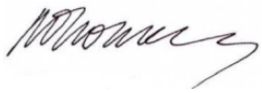
I have reviewed the application of the test of significance under section 1.5 and 7.3 of the BC Act and clause 1.4 of the Biodiversity Conservation Regulation 2017 and determinate that the development (as described in the revised BDAR Waiver request report prepared by Biosis dated 6 February 2023) is not likely to have any significant impact on biodiversity values. The application, therefore, does not need to be accompanied by a BDAR. Accordingly, a waiver under section 7.9 is granted for the proposed development (SSD-41814831).

The delegated "Environment Agency Head" in the Biodiversity and Conservation Division of the Department's Environment and Heritage Group has also granted a waiver (see attached).

This waiver is issued in respect of the proposed development detailed in the Secretary's Environmental Assessment Requirements dated 09 May 2022. Amendments to the development may require a further waiver to be sought and issued.

Should you have any further enquiries, please contact Patrick Andrade on (02) 9995 5654 or via email at Patrick.andrade@dpie.nsw.gov.au

Yours sincerely,



Madeline Thomas

A/Team Leader

School Infrastructure Assessments

as delegate for the Secretary

Attached: EHG Determination

A.13 Executive Summary from Preliminary Site Investigation (Contamination) Report

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Preliminary Site Investigation and Detailed Site Investigation (Contamination)

Newcastle High School Upgrade
25a National Park Street, Newcastle West

Prepared for
School Infrastructure NSW

Project 213618.02
June 2023

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	213618.02	Document No.	R.001.Rev1
Document title	Report on Preliminary Site Investigation and Detailed Site Investigation (Contamination) Newcastle High School Upgrade		
Site address	25a National Park Street, Newcastle West		
Report prepared for	School Infrastructure NSW		
File name	213618.02.R.001.Rev1.docx		

Document status and review

Status	Prepared by	Reviewed by	Date issued
Draft A	Dana Wilson	Matthew Blackert	23 January 2023
Revision 0	Dana Wilson	Matthew Blackert	3 May 2023
Revision 1	Dana Wilson	Matthew Blackert	14 June 2023

Distribution of copies

Status	Electronic	Paper	Issued to
Draft A	1	0	Robbie McIntosh, School Infrastructure NSW
Revision 0	1	0	Robbie McIntosh, School Infrastructure NSW
Revision 1	1	0	Robbie McIntosh, School Infrastructure NSW

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author	pp	14 June 2023
Reviewer		14 June 2023

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Executive Summary

Douglas Partners Pty Ltd (DP) has undertaken a preliminary site investigation (PSI) and detailed site investigation (DSI) for the proposed upgrade at Newcastle High School, 25a National Park Street, Newcastle West.

The investigation area (the site) is located within Newcastle High School. The proposed development comprises a new learning hub building (three-storey), new multipurpose hall, demolition and relocation of some existing structures, ancillary works and implementation of a landscaping strategy for continued secondary school use. Accordingly, the area subject of the DSI (the site) was limited to these specific areas and the general surrounds as shown on Drawing 1 in Appendix H and as instructed by the client.

A concurrent PSI and DSI was undertaken, with the PSI comprising a desktop and site history review to assess the potential for contamination at the site based on past and present land uses and inform the scope of work for the subsurface investigation. The DSI was staged, with an initial subsurface soil investigation program followed by a subsequent soil, groundwater and surface water and hazardous gas screening (HGG) program to further assess site conditions.

The report has also been updated following initial feedback on the Draft A report from Fiona Robinson, NSW EPA Contaminated Site Auditor, engaged by School Infrastructure NSW to conduct a statutory Site Audit for the proposed development.

The objectives of this DSI were to assess the suitability of the site for the proposed development and whether further investigation and/or management is required regarding the proposed development. It is understood that the DSI report will be used to support a development application for the on-going and proposed continued secondary school use.

The investigation included desktop / site history review, site inspection, subsurface investigation at comprising 86 soil testing locations (pits / boreholes/surface samples), six groundwater monitoring wells, two surface water locations, landfill gas screening, laboratory testing and preparation of this report.

The site history review indicated former site uses/activities including undeveloped grazing land, golf course (early 1900s), filling/raising of site levels and construction of the drainage canal to the north and later staged school development from 1927. Mapping suggested that the north-eastern part of the site compromised anthropogenic fill extending from the north / north-eastern part of the site and then extending to the north towards and including the former gas works site at Steel Street Newcastle. Filling within this area may have the potential to include waste materials associated with the gasworks (ash, slag etc) as well as "*all manner of waste, including building debris"* (EMM, 2022).

The site history review did not identify the presence of gross potentially contaminating activities, however, a number of potential contaminant sources / activities were identified at the site as follows: the presence of fill (source unknown), demolition/renovation of buildings, possible pesticide use, storage of chemicals / fuels, chemical storage associated with photography darkroom and disposal practices, drips / spills from parked cars, irrigation of groundwater for ground maintenance, underground utilities and pipes containing hazardous building materials (HBM), surface / groundwater base flows adjacent to site boundary and HGG associated with former mine workings and anthropogenic fill with coal inclusions and natural organic rich soils:.

The site inspection, subsurface investigation and laboratory testing generally indicated the absence of gross chemical contamination at the test locations and depths investigated (i.e. absence of obvious staining / odour in soils, groundwater and surface water).

Fill was identified across the site to depths of between 0.1 m and 3.1 m, noting that the full depth of fill was not identified in some test locations (typically hand auger bores due to refusal). The depth of fill was greatest for the north / north-eastern parts of the site in historical fill placement areas (<1940s) rather than more recent importation of materials. Fill materials comprised various anthropogenic materials including building wastes, coal, coal chitter, slag, ash and asphalt. Fibro sheeting fragments (confirmed as asbestos containing materials (ACM) were identified within filling at five locations, in addition to five fragments identified at the surface in other parts of the site.

Groundwater was identified at depths of between 1.0 m and 2.8 m below ground level in pits / bores and 1.0 to 2.45 m bgl (RL 0.9 to 1.75 AHD) for installed groundwater monitoring wells.

Laboratory testing was undertaken for a range of potential contaminants for selected soil samples from the test pits/bores. The majority of the tested soils were within the adopted human health and ecological guidelines for public open space land use for chemical contaminants. The exceedances primarily relate to elevated heavy metals, TRH, BTEX, PAH, PFAS and asbestos which are largely attributed to the presence of imported fill material.

Bonded asbestos containing materials (ACM) were identified within upper filling at five test locations (Bore 209 and Pits 305, 307, 517 and 518). Asbestos fines / friable asbestos (< 7 mm) were also identified in fill at two locations (503/0.25 m and 505/0.6 m) which did not identify ACM fragments during sieving. Given the widespread presence of fill at the site, most notably the north/north-eastern boundary where fill was identified up to 3.1 m depth, and the presence of demolition waste within fill across the site, additional ACM is likely to be present across the site distributed within site filling including near surface soils.

Leachability testing of soils with elevated heavy metals, hydrocarbons and PFAS indicated that the soils tested had a low propensity to leach hydrocarbons, and some propensity to leach heavy metals and PFAS.

Slightly elevated heavy metals, PAH and PFAS were identified in groundwater and surface water with no obvious spatial distribution for up, mid and downgradient locations. The metal concentrations in groundwater are considered to be typically representative of natural background conditions in the urban city environment; PFAS concentrations in groundwater are generally considered to be indicative of urban conditions which contain PFAS in the environment at trace concentrations. Minor PAH concentrations suggest minor impact to groundwater from PAH impacted fill. Given the extensive nature of the fill on site, which is mapped to extend well beyond the site boundary and downgradient of the site, the minor PAH impact to groundwater is not considered significant. Groundwater remediation is not considered to be required, however, cessation of groundwater irrigation at the school is recommended as outlined below.

Remediation and/or management of the site will be required to address the heavy metals, TRH, BTEX, PAH and asbestos impacted soil/fill at the site to render the site suitable for the on-going and proposed continued secondary school use.

It is noted that while one test location (Bore 222) indicated elevated PFAS above ecological criteria, the risk of indirect exposure of PFAS is considered to be low.

Given the extensive nature of impacted materials, in particular the depth of fill in the north/north-eastern part of the site up to 3.1 m, excavation and off-site disposal of all identified contamination is not likely be practical/economically feasible. Given much of the site in impacted areas is proposed for new buildings / permanent pavements and the site requires more fill than cut, on-site management / capping would be considered the most practical remediation approach. This approach would avoid significant expenses associated with off-site disposal of materials to a licensed landfill. A combination of both remediation options could also be considered where practical.

In the absence of a detailed asbestos assessment (double to triple the density of testing), the whole of the site investigation area would be subject to remediation works to address potential/actual asbestos impacts.

Given the groundwater assessment has not identified significant impacts to groundwater from on-site fill/soil on-site management / capping with a low permeability capping is not likely to be required. Direct infiltration of stormwater into infiltration pits within contaminated fill materials (as currently proposed), however, would not be recommended as a precautionary measure given the characteristics of the fill materials and the potential for leaching and groundwater impacts at these localised areas. Alternative locations and/or redesign of these proposed stormwater management structures is recommended in consultation with DP and the Site Auditor.

The proposed remediation strategy, remediation action criteria and validation requirements will need to be outlined in a site-specific remediation action plan (RAP).

If on-site management is selected as the remediation option, preparation of a long-term environmental management plan (EMP) would be required. On-site containment will attract a notice on the site Section 10.7 planning certificate and would require enforceable controls to ensure the contaminated soils are appropriately managed into the future.

Whilst a number of generally minor data gaps remain (refer Section 16.3), it is considered that these can be suitably managed via implementation of the RAP and unexpected finds protocol (UFP).

The following recommendations are provided:

- Preparation of a site-specific RAP to integrate with the specifics of the proposed development, such as areas of capping / open space and staging requirements. The RAP should include:
    - Requirements for environmental inspection and further assessment (where required) beneath buildings/pavements following demolition;
    - Unexpected finds protocol (UFP) for earthworks for the site given the risk of further ACM impact to be identified during remediation and redevelopment works and remaining data gaps;
    - Hazardous materials assessments are required prior to building demolition and should include HBM removal, validation, inspections and clearances by appropriately qualified and licensed persons;
- Alternative locations and/or redesign of proposed stormwater management structures to avoid direct infiltration of stormwater into fill given the characteristics of the materials and the potential for leaching and groundwater impacts at these localised areas (in consultation with DP and the Site Auditor);
- Implementation of the following interim measures to minimise potential exposure to student, staff and workers at the site:
    - Exposed soils at test locations (pits etc) or bare areas with visible anthropogenics including ash, glass, porcelain etc are top dressed and/or turfed after raking and collection of larger fragments to minimise exposure;
    - Staff are made aware of potential surface ACM impacts and encouraged to report any observed fragments to management who should arrange for localised collection, disposal and reporting of fibro in grounds as per the school Asbestos Management Plan / SI NSW standard procedures.
- Use of the groundwater bore for school irrigation is ceased (i.e. to remove the direct contact exposure pathway).

A.14 SSDA Compliance Conditions

		Newcastle Education Campus	RESPONSIBILITY
	CC	CONDITIONS SSD-41814831	
		SCHEDULE 1	
Application Number:		SSD-41814831	Note
Applicant:		Department of Education	Note
Consent Authority:		Minister for Planning and Public Spaces	Note
Site:		Lot 1 - DP 150725, Lot 1 – DP 575171, Lot 1 – DP 794827 25A National Park Street, Newcastle West	Note
Development:		Staged upgrades to Newcastle High School comprising demolition, relocation and refurbishment of existing buildings, construction of new buildings, covered walkways, drop -off/pick up, waste and sporting facilities, tree removal, landscaping, and ancillary works including public domain infrastructure.	Note
		DEFINITIONS	
Aboriginal object		Has the same meaning as the definition of the term in section 5 of the National Parks and Wildlife Act 1974	Note
Aboriginal place		Has the same meaning as the definition of the term in section 5 of the National Parks and Wildlife Act 1974	Note
Accredited Certifier		Means the holder of accreditation as an accredited certifier under the Building Professionals Act 2005 acting in relation to matters to which the accreditation applies.	Note
Advisory Notes		Advisory information relating to the consent but do not form a part of this consent	Note
Applicant		The Department of Education, or any other person carrying out any development to which this consent applies	Note
Approved disturbance area		The area identified as such on the development layout	Note
Archaeological Salvage		A program of salvage excavation/s to recover information and/or objects from identified archaeological sites listed within the Aboriginal Cultural Heritage Assessment prepared by EMM dated April 2023 and Archaeological Assessment and Statement of Heritage Impact prepared by EJE Heritage dated May 2023.	Note
BCA		Building Code of Australia	Note
CEMP		Construction Environmental Management Plan	Note
Certification of Crown building work		Certification under section 6.28(2) of the EP&A Act	Note
Certifier		Means a council or accredited certifier or in the case of Crown development, a person qualified to conduct a Certification of Crown Building work	Note
Conditions of this consent		The conditions contained in Schedule 2 of this document	Note
Construction		All physical work to enable operation including (unless specifically excluded by a condition) but not limited to the demolition and removal of buildings, the carrying out of works for the purposes of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by this consent, but excluding the following: • building and road dilapidation surveys; • investigative drilling or investigative excavation; • Archaeological Salvage; • establishing temporary site offices (in locations identified by the conditions of this consent); • installation of environmental impact mitigation measures, fencing, enabling works; and • minor adjustments to services or utilities. However, where heritage items, or threatened species or threatened ecological communities (within the meaning of the Biodiversity Conservation Act 2016 or Environment Protection and Biodiversity Conservation Act 1999) are affected or potentially affected by any physical work, that work is construction, unless otherwise determined by the Planning Secretary in consultation with EHG or DPE Fisheries (in the case of impact upon fish, aquatic invertebrates or marine vegetation)	Note
Council		Newcastle City Council	Note
Day		The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays	Note
Demolition		The deconstruction and removal of buildings, sheds and other structures on the site	Note
Department		NSW Department of Planning and Environment	Note
Development		The development described in the EIS and Response to Submissions, including the works and activities specified in Schedule 1 and as modified by the conditions of this consent	Note
Earthworks		Bulk earthworks, site levelling, import and compaction of fill material, excavation for installation of drainage and services	Note
EHG		Environment and Heritage Group, Department of Planning and Environment	Note
EIS		The Environmental Impact Statement titled Environmental Impact Statement State Significant Development Newcastle Education Campus (SSD -41814831), prepared by Gyde dated 28 September 2023, submitted with the application for consent for the development, including any additional information provided by the Applicant in support of the application.	Note
ENM		Excavated Natural Material	Note
Environment		Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings	Note
EPA		NSW Environment Protection Authority	Note
EP&Aact		Environmental Planning and Assessment Act 1979	Note
EP&A Regulation		Environmental Planning and Assessment Regulation 2021	Note
Evening		The period from 6pm to 10 pm	Note
Feasible		Means what is possible and practical in the circumstances	Note
Heritage		Encompasses both Aboriginal and historic heritage including sites that predate European settlement, and a shared history since European settlement	Note
Heritage NSW		Heritage NSW, the Department of Planning and Environment	Note
Heritage Item		An item as defined under the Heritage Act 1977, and assessed as being of local, State and/ or National heritage significance, and/or an Aboriginal Object or Aboriginal Place as defined under the National Parks and Wildlife Act 1974', the World Heritage List, or the National Heritage List or Commonwealth Heritage List under the Environment Protection and Biodiversity Conservation Act 1999 (Cth), or anything identified as a heritage item under the conditions of this consent	Note
Incident		An occurrence or set of circumstances that causes, or threatens to cause, material harm and which may or may not be, or cause, a non - compliance Note: "material harm" is defined in this consent	Note
Independent Audit Post Approval Requirements		Independent Audit Post Approval Requirements 2020 (or other updated version as available on the Department's website)	Note
Land		Has the same meaning as the definition of the term in section 1.4 of the EP&A Act	Note
EMP		Environmental Management Plan	Note
Management and mitigation measures		The management and mitigation measures set out in Appendix P of the RtS	Note
Material harm		Is harm that: a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; or b) results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) Note: For the purposes of this definition, material harm excludes incidents captured by Work Health and Safety reporting requirements.	Note
Minister		NSW Minister for Planning and Public Spaces (or delegate)	Note
Mitigation		Activities associated with reducing the impacts of the development prior to or during those impacts occurring	Note
Monitoring		Any monitoring required under this consent must be undertaken in accordance with section 9.39 of the EP&A Act	Note
Night		The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays	Note
Non-compliance		An occurrence, set of circumstances or development that is a breach of this consent	Note
OEMP		Operational Environmental Management Plan	Note
Operation		The carrying out of the approved purpose of the development upon completion of construction excluding operational readiness work	Note
PA		Means a planning agreement within the meaning of the term in section 7.4 of the EP&A Act	Note
Operational readiness work		Use of the completed areas of the development by school staff to prepare for the operation of the development	Note
Planning Secretary		Planning Secretary under the EP&A Act, or nominee	Note
POEO Act		Protection of the Environment Operations Act 1997	Note
Reasonable		Means applying judgement in arriving at a decision, taking into account: mitigation, benefits, costs of mitigation versus benefits provided, community views, and the nature and extent of potential improvements	Note
Registered Aboriginal Parties		Means the Aboriginal persons identified in accordance with the document entitled "Aboriginal cultural heritage consultation requirements for proponents 2010" (DECCW)	Note
Rehabilitation		The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting	Note
Response to submissions		The Applicant's response to issues raised in submissions received in relation to the application for consent for the development under the EP&A Act, prepared by Gyde dated 27 October 2023.	Note
SANSW		Subsidence Advisory NSW (formerly the Mine Subsidence Board)	Note
Sensitive receivers		A location where people are likely to work, occupy or reside, including a	Note
Site		The land defined in Schedule 1	Note
Site Auditor		As defined in section 4 of the Contaminated Land Management Act 1997	Note
Site Audit Report		As defined in section 4 of the Contaminated Land Management Act 1997	Note
Site Audit Statement		As defined in section 4 of the Contaminated Land Management Act 1997	Note
Supplementary Response to Submissions		The further information provided in the report and appendices, titled Supplementary Response to Submissions Report, prepared by Gyde and dated 4 December 2023.	Note
TfNSW		Transport for New South Wales	Note
Waste		Has the same meaning as the definition of the term in the Dictionary to the POEO Act	Note
Year		A period of 12 consecutive months	Note
		SCHEDULE 2	
		PART A ADMINISTRATIVE CONDITIONS	
		Obligation to Minimise Harm to the Environment	
A1.		In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and, if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction and operation of the development.	All Parties
		Terms of Consent	
A2.		The development may only be carried out: (a) in compliance with the conditions of this consent; (b) in accordance with all written directions of the Planning Secretary; (c) generally in accordance with the EIS and Response to Submissions; (d) in accordance with the approved plans in the table below:	All Parties

A3.		Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to: (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary; (b) any reports, reviews or audits commissioned by the Planning Secretary regarding compliance with this approval; and (c) the implementation of any actions or measures contained in any such document referred to in (a) above.	Principal
A4.		The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document listed in condition A2(c). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in condition A2(c), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.	Principal
		Limits of Consent	
A5.		This consent lapses five years after the date of consent unless work is physically commenced.	Principal
		Prescribed Conditions	
A6.		The Applicant must comply with all relevant prescribed conditions of development consent under Part 4, Division 2 of the EP&A Regulation.	Principal
		Planning Secretary as Moderator	
A7.		In the event of a dispute between the Applicant and a public authority, in relation to an applicable requirement in this approval or relevant matter relating to the Development, either party may refer the matter to the Planning Secretary for resolution. The Planning Secretary's resolution of the matter must be binding on the parties.	Principal
		Evidence of Consultation	
A8.	**CC Note only**	Where conditions of this consent require consultation with an identified party, the Applicant must: (a) consult with the relevant party prior to submitting the subject document for information or approval; and (b) provide details of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.	Principal
		Staging	
A9.	CC1	The project may be constructed and operated in stages in accordance with the terms/conditions of this consent and the details set out in the Preliminary Staging Report prepared by Gyde dated 25 October 2023.	Principal
A10.	CC1	Construction staging of the proposed development may be varied in accordance with a revised Staging Report submitted to and approved by the Planning Secretary.	Principal
A11.	CC1	Any revised Staging Report prepared in accordance with condition A10 must: (a) maintain the staged operation with the terms/conditions of this consent and the details set out in the Preliminary Staging Report prepared by Gyde dated 25 October 2023; (b) set out how the construction of the whole project will be staged, including details of work and other activities to be carried out in each stage and the general timing of when construction of each stage will commence and finish; (c) if staged construction is proposed, set out how the construction of the whole of the project will be staged, including details of work and other activities to be carried out in each stage and the general timing of when construction of each stage will commence and finish; (d) specify how compliance with conditions will be achieved across and between each of the stages of the project; (e) specify how compliance with independent auditing requirements will be achieved across and between each of the stages of the project; and (f) set out mechanisms for managing any cumulative impacts arising from the proposed construction staging.	Principal
A12.	CC1	The project must be staged in accordance with the details approved under condition A9 unless a revised Staging Report has been approved under condition A10 in which case the project must be staged in accordance with the approved revised Staging Report.	Principal
A13.	CC1	The terms of this approval that apply or are relevant to the works or activities to be carried out in a specific stage set out in the details as approved under condition A9 must be complied with at the relevant time for that stage including independent auditing requirements.	All Parties
		Staging, Combining and Updating Strategies, Plans or Programs	
A14.		The Applicant may: (a) prepare and submit any strategy, plan (including management plan) or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan (including management plan) or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan (including management plan) or program); (b) combine any strategy, plan (including management plan), or program required by this consent (if a clear relationship is demonstrated between the strategies, plans (including management plan) or programs that are proposed to be combined); and (c) update any strategy, plan (including management plan), or program required by this consent (to ensure the strategies, plans (including management plan), or programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development).	Principal
A15.		Any strategy, plan or program prepared in accordance with condition A14, where previously approved by the Planning Secretary under this consent, must be submitted to the satisfaction of the Planning Secretary.	Principal
A16.		If the Planning Secretary agrees, a strategy, plan (including management plan), or program may be staged or updated without consultation being undertaken with all parties required to be consulted in the relevant condition in this consent.	Principal
A17.		Updated strategies, plans (including management plan), or programs supersede the previous versions of them and must be implemented in accordance with the condition that requires the strategy, plan, program or drawing.	Principal
		Structural Adequacy	
A18.		All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with the relevant requirements of the BCA and any additional requirements of the Subsidence Advisory NSW where the building or structure is located on land within a declared Mine Subsidence District. Notes: • Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 sets out the requirements for the certification of the development. • Under section 21 of the Coal Mine Subsidence Compensation Act 2017, the Applicant is required to obtain the Chief Executive of Subsidence Advisory NSW's approval before carrying out certain development in a Mine Subsidence District.	Contractor
		External Walls and Cladding	
A19.		The external walls of all buildings including additions to existing buildings must comply with the relevant requirements of the BCA.	Contractor
		Applicability of Guidelines	
A20.		References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent or as otherwise provided in the relevant document or applicable legislation.	All Parties
A21.		Consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.	All Parties
		Monitoring and Environmental Audits	
A22.		Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non compliance notification, Site audit report and independent auditing. Note: For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an "environmental audit" is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.	Contractor
		Access to Information	
A23.		At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must: (a) make the following information and documents (as they are obtained or approved) publicly available on its website: (i) the documents referred to in condition A2 of this consent; (ii) all current statutory approvals for the development; (iii) all approved strategies, plans and programs required under the conditions of this consent; (iv) regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent; (v) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; (vi) a summary of the current stage and progress of the development; (vii) contact details to enquire about the development or to make a complaint; (viii) a complaints register, updated monthly; (ix) audit reports prepared as part of any independent audit of the development and the Applicant's response to the recommendations in any audit report; (x) any other matter required by the Planning Secretary; and (b) keep such information up to date, to the satisfaction of the Planning Secretary and publicly available for 12 months after the commencement of operations.	All Parties
		Compliance	
A24.		The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	Contractor
		Incident Notification, Reporting and Response	
A25.		The Planning Secretary must be notified through the major projects portal immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident.	Principal
A26.		Subsequent notification must be given and reports submitted in accordance with the requirements set out in Appendix 2.	Principal
A27.		The Planning Secretary must be notified through the major projects portal within seven days after the Applicant becomes aware of any non -compliance. The Certifier must also notify the Planning Secretary through the major projects portal within seven days after they	Principal
A28.		The notification must identify the development and the application number for it, set out the condition of consent that the development is non -compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have	Principal
A29.		A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	Principal
		Revision of Strategies, Plans and Programs	
A30.		Within three months of: (a) the submission of an incident report under condition A26;	Principal
A31.		If necessary to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans, programs or drawings required under this consent must be revised, to the satisfaction of the Planning Secretary or Certifier (where previously approved by the Certifier). Where revisions are required, the revised document must be submitted to the Planning	Contractor
		PART B PRIOR TO COMMENCEMENT OF CONSTRUCTION	

		Notification of Commencement	
B1.		The Applicant must notify the Planning Secretary in writing of the dates of the intended commencement of construction and operation at least 48 hours before those dates.	All Parties
B2.		If the construction of the development is to be staged, the Planning Secretary must be notified in writing at least 48 hours before the commencement of each stage, of the date of commencement and the development to be carried out in that stage	All Parties
		Certified Drawings	
B3.		Prior to the commencement of construction, the Applicant must submit to the Certifier structural drawings prepared and signed by a suitably qualified practising Structural Engineer that demonstrates compliance with this development consent.	Contractor
		External Walls and Cladding	
B4.		Prior to the commencement of construction of external building walls and cladding within the relevant stage, the Applicant must provide the Certifier with documented evidence that the products and systems proposed for use or used in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the requirements of the BCA. The Applicant must provide a copy of the documentation given to the Certifier to the Planning Secretary within seven days after the Certifier accepts it.	Contractor
		Pre-Construction Dilapidation Report - Protection of Public Infrastructure	
B5.	**CC1**	Prior to the commencement of any construction, the Applicant must: (a) consult with the relevant owner and provider of services and Infrastructure that are likely to be affected by the development to make suitable arrangements for access to, diversion, protection and support of the affected infrastructure; (b) prepare a Pre-Construction Dilapidation Report identifying the condition of all public (nonresidential) infrastructure and assets in the vicinity of the site (including roads, gutters and footpaths) that have potential to be affected; (c) submit a copy of the Pre-Construction Dilapidation Report to the asset owner, Certifier and Council; and (d) provide a copy of the Pre-Construction Dilapidation Report to the Planning Secretary with 48 hours when requested.	Contractor
		Pre-Construction Survey - Adjoining Properties	
B6.	CC1	Prior to the commencement of any construction, the Applicant must offer a pre -construction survey to owners of residential buildings	Contractor
B7.		~~Where the offer for a pre -construction survey is accepted (as required by condition B6), the Applicant must arrange for a survey to be undertaken by a suitably qualified and experienced expert prior to the commencement of vibration generating works that could impact on the identified buildings.~~	Contractor
B8.		Prior to the commencement of any vibration generating works that could impact on the buildings surveyed as required by condition B7, the Applicant must: (a) provide a copy of the relevant survey to the owner of each residential building surveyed in the form of a Pre-Construction Survey Report; (b) submit a copy of the Pre-Construction Survey Report to the Certifier; and (c) provide a copy of the Pre-Construction Survey Report to the Planning Secretary within 48 hours when requested.	Contractor
		Community Communication Strategy	
B9.		No later than 48 hours before the commencement of construction, a Community Communication Strategy must be submitted to the Planning Secretary for information. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction. The Community Communication Strategy must: (a) identify people to be consulted during the design and construction phases; (b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development; (c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development; (d) set out procedures and mechanisms: (i) through which the community can discuss or provide feedback to the Applicant; (ii) through which the Applicant will respond to enquiries or feedback from the community; and (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation. (e) include any specific requirements around traffic, noise and vibration, tree retention, heritage.	Principal
		Ecologically Sustainable Development	
B10.	CC1	Prior to the commencement of construction, unless otherwise agreed by the Planning Secretary, the Applicant must demonstrate that ESD is being achieved by either: (a) registering for a minimum 5 star Green Star rating with the Green Building Council Australia and submit evidence of registration to the Certifier; or (b) seeking approval from the Planning Secretary for an alternative certification process.	Principal
		Outdoor Lighting	
B11.		Prior to commencement of lighting installation, evidence must be submitted to the Certifier that all outdoor lighting to be installed within the site has been designed to comply with AS 1158.3.1 :2005 Lighting for roads and public spaces - Pedestrian area (Category P) lighting - Performance and design requirements and AS 4282-2019 Control of the obtrusive effects of outdoor lighting.	Contractor
		Demolition	
B12	**CC1**	Prior to the commencement of demolition work plans required by AS 2601-2001 The demolition of structures (Standards Australia, 2001) must be accompanied by a written statement from a suitably qualified person that the proposals contained in the work plan comply with the safety requirements of the Standard. The work plans and the statement of compliance must be submitted to the Certifier.	Contractor
		Environmental Management Plan Requirements	
B13.	CC Note only	Management plans required under this consent must be prepared having regard to the relevant guidelines, including but not limited to the Environmental Management Plan Guideline: Guideline for Infrastructure Projects (DPIE April 2020). Notes: • The Environmental Management Plan Guideline is available on the Planning Portal at https.IANww.planningqportal.nsw.qov.aulmaior- proiectslassessmenVpost-approval • The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	Contractor
		Construction Environmental Management Plan	
B14.	**CC1**	Prior to the commencement of any construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary for information. The CEMP must include, but not be limited to, the following: (a) Details of: (i) hours of work; (ii) 24-hour contact details of site manager; (iii) management of dust and odour to protect the amenity of the neighbourhood; (iv) external lighting in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting; (v) community consultation and complaints handling as set out in the Community Communication Strategy required by condition B9; (b) an unexpected finds protocol for contamination and associated communications procedure to ensure that potentially contaminated material is appropriately managed; (c) an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure; (d) Construction Traffic and Pedestrian Management Sub-Plan (see condition B15); (e) Construction Noise and Vibration Management Sub-Plan (see condition B16); (f) Construction Waste Management Sub-Plan (see condition B17); (g) Construction Soil and Water Management Sub-Plan (see condition B18); (h) Aboriginal Cultural Heritage Management Sub-Plan (see condition B19); (i) Cultural Heritage Management Sub-Plan (see condition B20); (j) Construction Flood Emergency Management Plan (see condition B21);	Contractor
B15.	**CC1**	The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following: (a) be prepared by a suitably qualified and experienced person(s); (b) be prepared in consultation with Council and TfNSW; (c) include a Driver Code of Conduct which must be prepared and communicated by the Applicant to heavy vehicle drivers and aim to: (i) minimise the impacts of earthworks and construction on the local and regional road network; (ii) minimise conflicts with other road users; (iii) minimise road traffic noise; and (iv) ensure truck drivers use specified routes; (d) detail: (i) measures to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services; (ii) measures to ensure the safety of vehicles and pedestrians accessing adjoining properties where shared vehicle and pedestrian access occurs; (iii) heavy vehicle routes, access and parking arrangements; (iv) the swept path of the longest construction vehicle entering and exiting the site in association with the new work, as well as manoeuvrability through the site, in accordance with the latest version of AS 2890.2; and (v) arrangements to ensure that construction vehicles enter and leave the site in a forward direction unless in specific exceptional circumstances under the supervision of accredited traffic controller(s)	Contractor

B16.	CC1	The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following: (a) be prepared by a suitably qualified and experienced noise expert; (b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009); (c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers; (d) include strategies that have been developed with the community for managing high noise generating works; (e) describe the community consultation undertaken to develop the strategies in condition B16 (d); (f) include a complaints management system that would be implemented for the duration of the construction; and (g) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures in accordance with the requirements of condition B13.	Contractor
B17.	CC1	The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the procedures for the management of waste including the following: (a) the recording of quantities, classification (for materials to be removed) and validation (for materials to remain) of each type of waste generated during construction and proposed use for materials to remain; (b) information regarding the recycling and disposal locations; and (c) confirmation of the contamination status of the development areas of the site based on the validation results.	Contractor
B18.	**CC1**	The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following: (a) be prepared by a suitably qualified expert, in consultation with Council; (b) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site; (c) describe all erosion and sediment controls to be implemented during construction, including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (41h edition, Landcom 2004) commonly referred to as the 'Blue Book'; (d) include an Acid Sulphate Soils Management Plan, if required, including measures for the management, handling, treatment and disposal of acid sulphate soils, including monitoring of water quality at acid sulphate soils treatment areas; (e) provide a plan of how all construction works will be managed in a wet-weather events (i.e. storage of equipment, stabilisation of the Site); (f) detail all off-site flows from the site; and (g) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 5 -year ARI and 1 in 100- year ARI.	Contractor
B19.	**CC1**	The Aboriginal Cultural Heritage Management Sub-Plan (ACHMSP) must address, but not be limited to, the following: (a) be prepared by a suitably qualified and experienced expert(s); (b) be prepared in consultation registered Aboriginal parties; (c) the recommendations of the Aboriginal Cultural Heritage Assessment Report prepared by EMM dated April 2023; (d) historical archaeological excavations and must be undertaken by a suitably qualified and experienced professional, in accordance with the requirements of the Heritage NSW within the Aboriginal Sites identified within the Aboriginal Cultural Heritage Assessment prepared by EMM dated April 2023.	Principal
B20.	**CC1**	The Cultural Heritage Management Sub-Plan (CHMSP) must address, but not be limited to, the following: (a) suitably qualified and experienced expert(s) are to identify any significant internal and external elements of the buildings that will be demolished for salvage and, if necessary, storage, for reuse as appropriate, including future interpretation opportunities. Removal of any items to be carried out in accordance with specific salvage methodologies provided by the qualified and experienced expert(s); (b) photographic archival records and must: (i) be prepared in accordance with the NSW Heritage Branch guidelines titled Photographic Recording of Heritage Items using Film or Digital Capture; (ii) be of the external and internal areas of the buildings on site and all other items of heritage significance on the site identified in the Statement of Heritage Impact prepared by EJE Heritage dated May 2023; and (iii) must be submitted to Council and the Planning Secretary; (c) historical archaeological excavations and must be undertaken by a suitably qualified and experienced professional, in accordance with the requirements of the Heritage NSW within the areas of archaeological potential identified within the Archaeological Assessment and Statement of Heritage Impact prepared by EJE Heritage dated May 2023.	Contractor
		Construction Flood Emergency Management Plan	
B21.	**CC1**	Prior to the commencement of each construction stage, a Construction Flood Emergency Management Plan, must be prepared by a suitably qualified and experienced person(s) in consultation with NSW State Emergency Services, submitted to the Certifier and a copy to the Planning Secretary for information, including but not limited to: (a) detail on triggers, including rainfall and water level, that require closure of the site; (b) detail on how site closure would be communicated to construction workers, before commencement of the work day; (c) details of drills, frequency and record management of the drills; (d) a map showing the flood-free pedestrian route from each construction site to a suitable location free of inundation; (e) details of any gauges or warning infrastructure that are to be provided to assist with flood management, including frequency of maintenance, and how these will be monitored; (f) identification of suitable locations for evacuation that are free of inundation; and (g) flood warning signs around the site to identify areas with Category H3 hazard and higher, in accordance with the Flood Hazard Flood Risk Management Guide FB03, NSW Department of Planning and Environment and are within the overland flow path.	Principal
		Flood Management	
B22.		Prior to the commencement of construction of Stage 3 as identified in the Preliminary Staging Plan prepared by EJE Architecture dated 25 October 2023, verification from a suitably qualified structural engineer must be provided to the Certifier demonstrating that primary structures have been designed with flood compatible materials and components that withstand the hydrodynamic forces from moving flow and the hydrostatic forces applied by still-water during any period of flood inundation and/or submerging events, as identified in the Structural Response to Submission, prepared by Stantec, dated 21 September 2023.	Contractor
B23.		Prior to the commencement of construction of the relevant stage, the Applicant must provide evidence from a suitably qualified chartered engineer to the Certifier and Planning Secretary confirming that: (a) the habitable floor level of any new building is above the 1% annual exceedance probability (AEP) level and that the development achieves the required flood planning levels and design ground floor levels outlined in Flood Impact Assessment, prepared by BMT and dated 3 May 2023; (b) any part of new buildings below the probable maximum flood (PMF) level are constructed from flood compatible building components; (c) any new buildings have been designed to ensure shelter in place of vulnerable persons is safe and in locations above the PMF level as outlined in the Flood Emergency Response Plan, prepared by BMT and dated 19 October 2023; and (d) any new building has been designed, so that the part of the building that will be used for egress after a flood event will be safe to be used for this purpose after the flood waters recede from the 1% AEP through to PMF flood events described in the Flood Impact Assessment, prepared by BMT and dated 3 May 2023.	Contractor
		Construction Parking	
B24.	**CC1**	Prior to the commencement of any construction, the Applicant must submit a Construction Worker Transportation Strategy to the Certifier. The Strategy must detail the parking facilities to be used by construction workers as identified within the Traffic Impact Assessment prepared by Stantec dated 5 December 2023, or other travel arrangements for construction that would minimise demand for parking in nearby public and residential streets or public parking facilities. A copy of the strategy must be published on the Applicant's website in accordance with condition A23. This condition cannot be staged.	Contractor
		Operational Noise - Design of Mechanical Plant and Equipment	
B.25		Prior to installation of mechanical plant and equipment: (a) a detailed assessment of mechanical plant and equipment with compliance with the relevant operational noise levels as recommended in the Noise and Vibration Assessment for SSDA (SSD -41814831) Newcastle Education Campus dated 18 May 2023 and prepared by JHA Services must be undertaken by a suitably qualified person; and (b) evidence must be submitted to the Certifier that any noise mitigation recommendations identified in the assessment carried out under (a) have been incorporated into the design to ensure the development will not exceed the operational noise levels identified in the Noise and Vibration Assessment for SSDA (SSD -41814831) Newcastle Education Campus dated 18 May 2023 and prepared by JHA Services.	Contractor
		Aboriginal Heritage	
B.26	**CC1**	Prior to the commencement of construction, the Applicant must consult with Registered Aboriginal Parties to determine specific requirements and management measures to be used on site during construction, including protection of any objects or items in perpetuity.	Principal
		Operational Waste Storage and Processing	
B27.		Prior to the commencement of construction of waste storage and processing areas, the Applicant must obtain agreement from Council for the design of the operational waste storage area (where waste removal will be undertaken by Council). Where waste removal will be undertaken by a third party, evidence must be provided to the Certifier that the design of the operational waste storage area: (a) is constructed using solid non-combustible materials; (b) is designed to ensure the door/gate to the waste storage area is vermin proof and can be openable from both inside and outside the storage area at all times; (c) includes a water supply with a hose through a centralised mixing valve; (d) is naturally ventilated or an air handling exhaust system must be in place; and (e) includes signage to clearly describe the types of materials that can be deposited into recycling bins and general garbage bins.	Contractor
		Public Domain Improvements	

B28.		Prior to the commencement of construction of any road works or pedestrian infrastructure, the Applicant must submit plans and technical specifications for the following works (to the satisfaction of the relevant roads authority), generally in accordance with the public domain plan provided in the Traffic Impact Assessment prepared by Stantec dated 5 December 2023: (a) the provision of a up to 2.2 metre shared path on Smith Street, from Parkway Avenue to the Multipurpose Facility Entry (Gate 1.1) (b) the replacement of parts of the footpath on Parkway Avenue (c) the provision of footpath connections to new site entries on Smith Street, Parkway Avenue and National Park Street (d) provision of two crossovers on National Park Street (e) the provision of an expanded crossover on Smith Street (f) the provision of additional bus bay and drop-off and pick-up facilities on Parkway Avenue (g) the provision of drop-off and pick-up facilities on Smith Street Notes: • Approval must be obtained for roadworks under section 138 of the Roads Act 1993. • Any proposed changes to on-street traffic and parking including signage must be approved by the Newcastle City Traffic Committee. • All costs associated with the proposed road upgrade works must be borne by the Applicant. • In accordance with Section 4.42 of the Environmental Planning and Assessment Act 1979, an approval under Section of the 138 Roads Act 1993 cannot be refused if it is necessary for carrying out state significant development that is authorised by a development consent and is substantially consistent with the consent.	Contractor
		Operational Access, Car Parking and Service Vehicle Arrangements	
B29.		Prior to the commencement of construction of access facilities, evidence of compliance of the design of vehicle access arrangements with the following requirements must be submitted to the Certifier: (a) the existing 40 on-site car parking spaces being available for use during operation of the development; and (b) the swept path of the largest service vehicle entering and exiting the Site in association with the new work, as well as manoeuvrability through the site, must be in accordance with the latest version of AS 2890.2.	Contractor
		Public Domain Works	
B30.		Prior to the commencement of any footpath or public domain works, the Applicant must consult with Council and demonstrate to the Certifier that the streetscape design and treatment meets the requirements of Council, including addressing pedestrian management. The Applicant must submit documentation of approval for each stage from Council to the Certifier.	Contractor
B31.		Prior to the commencement of any footpath or public domain works, the Applicant must: (a)F finalise thefinal layout and number of the driveways and crossings to the site with any redundant driveways and crossing being replaced with kerb and gutter and footway in accordance with the relevant Council specifications; (b)I investigate the installation of additional street trees on Smith Street, Parkway Avenue and National Park Street, in consultation with Council, and in accordance with the relevant Council specifications. The Applicant must submit documentation of approval from Council to the Certifier.	Contractor
		Site Contamination	
B32.	CC1	Prior to the commencement of construction of the relevant stage, the Applicant must engage a NSW EPAaccredited Site Auditor to provide advice throughout the duration of works to ensure that any work required in relation to soil or groundwater contamination is appropriately managed.	Principal
		Dewatering	
B33.	**CC1**	Prior to the commencement of construction, the Dewatering Management Plan prepared by Douglas Partners dated September 2023 shall be updated in consultation with the Department (DPE Water).	Contractor
B34	**CC1**	The Applicant shall submit the revised Dewatering Management Plan required under B32 to the Planning Secretary for approval, together with suitable evidence the updated Dewatering Management Plan meets the requirements of the Department (Water)	Contractor
		PART C DURING CONSTRUCTION	
		Site Notice	
C1.		A site notice(s) must be prominently displayed at the boundaries of the site during construction for the purpose of informing the public of project details and must satisfy the following requirements: (a) minimum dimensions of the site notice(s) must measure 841 mm x 594 mm (A 1) with any text on the site notice(s) to be a minimum of 30 -point type size; (b) the site notice(s) must be durable and weatherproof and must be displayed throughout the works period; (c) the approved hours of work, the name of the builder, Certifier, structural engineer, site/ project manager, the responsible managing company (if any), its address and 24 -hour contact phone number for any inquiries, including construction/ noise complaint must be displayed on the site notice(s); and (d) the site notice(s) must be mounted at eye level on the perimeter hoardings/fencing and must state that unauthorised entry to the site is not permitted.	Contractor
		Operation of Plant and Equipment	
C2.		All construction plant and equipment used on site must be maintained in a proper and efficient condition and operated in a proper and efficient manner.	Contractor
		Demolition	
C3.		Demolition work must comply with the demolition work plans required by Australian Standard AS 2601-2001 The demolition of structures (Standards Australia, 2001) and endorsed by a suitably qualified person as required by condition B12.	Contractor
		Construction Hours	
C4.		Construction, including the delivery of materials to and from the site, may only be carried out between the following hours: . No work may be carried out on Sundays or public holidays.	Contractor
C5.		Notwithstanding condition C4, provided noise levels do not exceed the existing background noise level plus 5dB, works may also be undertaken during the following hours: (a) between 6pm and 7pm, Mondays to Fridays inclusive; and (b) between 1pm and 4pm, Saturdays.	Contractor
C6.		Construction activities may be undertaken outside of the hours in condition C4 and C5 if required: (a) by the Police or a public authority for the delivery of vehicles, plant or materials; or (b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or (c) where the works are inaudible at the nearest sensitive receivers; or (d) for the delivery, set-up and removal of construction cranes, where notice of the crane related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or (e) where a variation is approved in advance in writing by the Planning Secretary justification is provided for the works.	Contractor
C7.		Notification of such construction activities as referenced in condition C6 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.	Contractor
C8.		Rock breaking, rock hammering, sheet pilling, pile driving and similar activities may only be carried out between the following hours: (a) 9am to 12pm, Monday to Friday; (b) 2pm to 5pm Monday to Friday; and (c) 9am to 12pm, Saturday.	Contractor
		Implementation of Management Plans	
C9.		The Applicant must carry out the construction of the development in accordance with the most recent version of the CEMP (including Sub-Plans).	Contractor
		Construction Traffic	
C10.		All construction vehicles (excluding site personnel vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site or an approved on-street work zone before stopping.	Contractor
		Hoarding Requirements	
C11.		The following hoarding requirements must be complied with: (a) no third-party advertising is permitted to be displayed on the subject hoarding/ fencing; and (b) the construction site manager must be responsible for the removal of all graffiti from any construction hoardings or the like within the construction area within 48 hours of its application.	Contractor
		No Obstruction of Public Way	

C12.		The public way (outside of any approved construction works zone) must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.	Contractor
		Construction Noise Limits	
C13.		The development must be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures identified in the approved Construction Noise and Vibration Management Plan.	Contractor
C14.		The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C4.	Contractor
C15.		The Applicant must implement, where practicable and without compromising the safety of construction staff or members of the public, the use of 'quackers' to ensure noise impacts on surrounding noise sensitive receivers are minimised.	Contractor
		Vibration Criteria	
C16.		Vibration caused by construction at any residence or structure outside the site must be limited to: (a) for structural damage, the latest version of DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures (German Institute for Standardisation, 1999); and (b) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: a technical guideline (DEC, 2006) (as may be updated or replaced from time to time).	Contractor
C17.		Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in condition C16.	Contractor
C18.		The limits in condit ions C16 and C17 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition 816 of this consent.	Contractor
		Project Arborist	
C19.		Prior to the commencement of construction of each relevant stage, a project arborist must be engaged to ensure all tree protection measures and works are carried out in accordance with the conditions of this consent. The project arborist must have a minimum Australian Qualification Framework Level 5 qualification and minimum 5 years' experience. Details of the arborist including name, business name and contact details must be provided to the Certifier.	Contractor
		Tree Protection	
C20.		For the duration of the construction works: (a) street trees must not be trimmed or removed unless it forms a part of this development consent or prior written approval from Council is obtained or is required in an emergency to avoid the loss of life or damage to property; (b) all street trees immediately adjacent to construction, or identified for protection within the Addendum to Arborist Report prepared by Joseph Pidutti Consulting Arborist dated 30 November 2023 (revision B), must be protected at all times during construction in accordance with Council's tree protection requirements. Any street tree, which is damaged or removed during construction due to an emergency, must be replaced in accordance with the relevant Council specifications; (c) all trees on the site that are not approved for removal must be suitably protected during construction as per the recommendations of the Aboricultural Impact Assessment prepared by Joseph Pidutti Consulting Arborist and dated 27 September 2023 (revision A) and Addendum to Arborist Report prepared by Joseph Pidutti Consulting Arborist dated 30 September 2023 (revision B); and (d) if access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater.	Contractor
		Air Quality	
C21.		The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.	Contractor
C22.		During construction, the Applicant must ensure that: (a) activities are carried out in a manner that minimises dust including emission of windblown or traffic generated dust; (b) all trucks entering or leaving the site with loads have their loads covered; (c) trucks associated with the development do not track dirt onto the public road network; (d) public roads used by these trucks are kept clean; and (e) land stabilisation works are carried out progressively on site to minimise exposed surfaces.	Contractor
		Imported Fill	
C23.		The Applicant must: (a) ensure that only VENM, ENM, or other material that meets the requirements of a relevant order and exemption issued by the EPA, is brought onto the site; (b) keep accurate records of the volume and type of fill to be used; and (c) make these records available to the Certifier and/or the Planning Secretary within seven days upon request.	Contractor
		Disposal of Seepage and Stormwater	
C24.		Adequate provisions must be made to collect and discharge stormwater drainage during construction. The prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter.	Contractor
		Emergency Management	
C25.		The Applicant must prepare and implement awareness training for employees and contractors, including locations of the assembly points and evacuation routes, for the duration of construction.	All Parties
		Stormwater Management System	
C26.		Within three months of the commencement of construction, the Applicant must design an operational stormwater management system for the development and submit it to the Certifier for approval. The system must: (a) be designed by a suitably qualified and experienced person(s); (b) be generally in accordance with the following conceptual design plans provided in the RtS: (i) Stormwater Drainage Plan - Sheet 1, dated 23 June 2023, revision I; (ii) Stormwater Drainage Plan - Sheet 2, dated 22 September 2023, revision O; (iii) Stormwater Drainage Plan - Sheet 3, dated 23 June 2023, revision I; (iv) Stormwater Drainage Plan - Sheet 4, dated 23 June 2023, revision I; (c)include the decommissioning, removal or capping of redundant pipes that discharge into the National Park Branch stormwater channel: (d) be in accordance with applicable Australian Standards; and (e) ensure that the system capacity has been designed in accordance with Australian Rainfall and Runoff (Engineers Australia, 2016) and Managing Urban Stormwater: Council Handbook (EPA, 1997) guidelines.	Contractor
		Aboriginal Cultural Heritage	
C27.		Construction must be undertaken in accordance with the recommendations of the Aboriginal Cultural Heritage Assessment Report prepared by EMM dated April 2023.	Principal
		Unexpected Finds Protocol - Aboriginal Heritage	
C28.		In the event that surface disturbance identifies a new Aboriginal object: (a) all works must halt in the immediate area to prevent any further impacts to the object(s); (b) a suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects; (c) the site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by Heritage NSW under Department of Premier and Cabinet and the management outcome for the site included in the information provided to AHIMS; (d) the Applicant must consult with the Aboriginal community representatives, the archaeologists and Heritage NSW to develop and implement management strategies for all objects/sites; and (e) works may only recommence with the written approval of the Planning Secretary.	Contractor
		Unexpected Finds Protocol - Historic Heritage	
C29.		If any unexpected archaeological relics are uncovered during the work, then: (a) all works must cease immediately in that area and notice is to be given to Heritage NSW and the Planning Secretary; (b) depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area as determined in consultation with Heritage NSW; and (c) works may only recommence with the written approval of the Planning Secretary.	Contractor
		Waste Storage and Processing	
C30.		All waste generated during construction must be secured and maintained within designated waste storage areas at all times and must not leave the site onto neighbouring public or private properties.	Contractor
C31.		All waste generated during construction must be assess, classified and managed in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014).	Contractor
C32.		The Applicant must ensure that concrete waste and rinse water are not disposed of on the site and are prevented from entering any natural or artificial watercourse.	Contractor
C33.		The Applicant must record the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations for the duration of construction.	Contractor
C34.		The Applicant must ensure that the removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility is in accordance with the requirements of the relevant legislation, codes, standards and guidelines.	Contractor
		Outdoor Lighting	
C35.		The Applicant must ensure that all external lighting is constructed and maintained in accordance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting.	Contractor
		Site Contamination	

C36.		Prior to the commencement of any work that would result in the disturbance of potential or contaminated soils, materials, groundwater or sediments, the Applicant must conduct site investigations to confirm the full nature and extent of the contamination at the project area and comply with the following requirements: (a) the site investigations must be undertaken, and the subsequent report(s), must be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997; (b) the reports must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme; and (c) the recommendations of the Remedial Action Plan prepared by Douglas Partners dated June 2023.	Contractor
C37.		The unexpected finds procedure within the Remedial Action Plan prepared by Douglas Partners dated June 2023 must be updated following results of further site investigations undertaken in accordance with condition C36 and implemented throughout duration of project work.	Contractor
C38.		Remediation of the site must be carried out in accordance with the Remediation Action Plan prepared by Douglas Partners dated June 2023 and any variations to the Remediation Action Plan approved by an NSW EPA-accredited Site Auditor.	Contractor
C39.		Where remediation is carried out / completed in stages, a NSW EPA-accredited Site Auditor must confirm satisfactory completion of each stage by the issuance of Interim Audit Advice(s).	Contractor
C40.		The Applicant must ensure the proposed development does not result in a change of risk in relation to any pre -existing contamination on the site that would result in significant contamination.	Contractor
		Independent Environmental Audit	
C41.		Independent Audits of the development must be conducted and carried out in accordance within the Independent Audit Post Approval Requirements.	Principal
C42.		Proposed independent auditors must be agreed to in writing by the Planning Secretary prior to the commencement of an Independent Audit.	Principal
C43.		The Planning Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those specified in the Independent Audit Post Approval Requirements, upon giving at least 4 week's notice (or timing) to the Applicant of the date upon which the audit must be commenced.	Principal
C44.		In accordance with the specific requirements in the Independent Audit Post Approval Requirements, the Applicant must: (a) review and respond to each Independent Audit Report prepared under condition C41 of this consent, or condition C43 where notice is given by the Planning Secretary; (b) submit the response to the Planning Secretary; and (c) make each Independent Audit Report, and response to it, publicly available within 60 days of submission to the Planning Secretary, unless otherwise agree by the Planning Secretary.	Principal
C45.		Independent Audit Reports and the Applicant's response to audit findings must be submitted to the Planning Secretary within two months of undertaking the independent audit site inspection as outlined in the Independent Audit Post Approval Requirements unless otherwise agreed by the Planning Secretary.	Principal
C46.		Notwithstanding the requirements of the Independent Audit Post Approval Requirements, the Planning Secretary may approve a request for ongoing independent operational audits to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an audit has demonstrated operational compliance.	Principal
		Operational Readiness Work	
C47.		Operational readiness work must not commence on site until the following details have been submitted to the Certifier: (a) a plan and description of the area(s) of the site to be used for operational readiness work (including pedestrian access) and areas still under construction (including construction access); (b) the maximum number of staff to be involved in operational readiness work on site at any one time; (c) arrangements to ensure the safety of school staff on the site, including how: (i) areas to be used for operational readiness work will be clearly and securely separated from the areas of the site still under construction; (ii) pedestrian access to and within the site will be managed to ensure no conflict with construction vehicle movements; and (d) access and parking arrangements to minimise impacts on the surrounding street network having regard to number of staff involved in operational readiness work on site at any one time and parking arrangements for construction workers on site.	Contractor
C48.		Operational readiness work must only be undertaken in accordance with the details submitted under condition C47 and the following requirements: (a) no more than 20 staff are involved in operational readiness work; (b) no more than 10 vehicles must access the school related to the operational readiness work; (c) no students or parents are permitted; and (d) the Applicant has implemented appropriate arrangements to ensure the safety of school staff.	Contractor
		Dewatering	
C49.		During construction, should groundwater be intercepted, the Applicant must obtain a Water Access Licence (WAL) under the Water Management Act 2000 unless an exemption under section 21 (6) applies under the Water Management (General) Regulation 2018.	Contractor
C50.		If required, a water supply work approval under the Water Management Act 2000 shall be obtained.	Contractor
C51.		The Applicant must implement the Dewatering Management Plan required under condition B32 including any recommendations or mitigation measures.	Contractor
		PART D PRIOR TO COMMENCEMENT OF OPERATION	
		Notification of Occupation	
D1.		At least one month before commencement of any operation, the date of commencement of the operation of the development must be notified to the Planning Secretary in writing. If the operation of the development is to be staged, the Planning Secretary must be notified in writing at least one month before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.	Contractor
		External Walls and Cladding	
D2.		Prior to commencement of operation of each relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the Applicant must provide the Certifier with documented evidence that the products and systems used in the construction of external walls including finishes and claddings such as synthetic or aluminium composite panels comply with the requirements of the BCA.	Contractor
D3.		A copy of the documentation given to the Certifier must be made available on the Applicant's website within seven days after the Certifier accepts it.	Contractor
		Works as Executed Plans	
D4.		Prior to the commencement of operation of each relevant stage, as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023,, works-as-executed plans signed by a registered surveyor demonstrating that the stormwater drainage and finished ground levels have been constructed as approved, must be submitted to the Certifier.	Contractor
		Warm Water Systems and Cooling Systems	
D5.		The installation of warm water systems and water cooling systems (as defined under the Public Health Act 2010) must comply with the Public Health Act 2010, Public Health Regulation 2012 and Part 1 (or Part 3 if a Performance-based water cooling system) of AS/NZS 3666.2:2011 Air handling and water systems of buildings - Microbial control - Operation and maintenance and the NSW Health Code of Practice for the Control of Legionnaires' Disease.	Contractor
		Outdoor Lighting	
D6.		Prior to the commencement of operation of each relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the Applicant must submit evidence from a suitably qualified practitioner to the Certifier that demonstrates that installed lighting associated with the development achieves the objective of minimising light spillage to any adjoining or adjacent sensitive receivers and: (a) complies with the latest version of AS 4282-2019 - Control of the obtrusive effects of outdoor lighting (Standards Australia, 1997); and (b) has been mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.	Contractor
		Mechanical Ventilation	
D7.		Prior to commencement of operation of each relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the Applicant must provide evidence to the Certifier that the installation and performance of the mechanical ventilation systems complies with: (a) AS 1668.2-2012 The use of air-conditioning in buildings - Mechanical ventilation in buildings and other relevant codes; and (b) any dispensation granted by Fire and Rescue NSW.	Contractor
		Operational Noise - Design of Mechanical Plant and Equipment	
D8.		Prior to commencement of operation of each relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the Applicant must submit evidence to the Certifier that the noise mitigation recommendations in the assessment undertaken under condition 824 have been incorporated into the design of mechanical plant and equipment to ensure the development will not exceed the recommended operational noise identified in the Noise and Vibration Assessment for SSDA (SSD - 41814831) Newcastle Education Campus dated 18 May 2023 and prepared by JHA Services.	Contractor
		Fire Safety Certification	
D9.		Prior to commencement of occupation of each relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, a Fire Safety Certificate must be obtained for all the Essential Fire or Other Safety Measures forming part of this consent. A copy of the Fire Safety Certificate must be submitted to the relevant authority and Council. The Fire Safety Certificate must be prominently displayed in the building.	Contractor
		Structural Inspection Certificate	
D10.		Prior to the commencement of occupation of the relevant parts of any new or refurbished buildings, a Structural Inspection Certificate or a Compliance Certificate must be submitted to the Certifier. A copy of the Certificate with an electronic set of final drawings (contact approval authority for specific electronic format) must be submitted to the Planning Secretary and the Council after: (a) the site has been periodically inspected and the Certifier is satisfied that the structural works is deemed to comply with the final design drawings; and (b) the drawings listed on the Inspection Certificate have been checked with those listed on the final Design Certificate/s.	Contractor
		Post-construction Dilapidation Report - Protection of Public Infrastructure	
D11.		Prior to the commencement of operation of the final stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the Applicant must engage a suitably qualified and experienced expert to prepare a Post-Construction Dilapidation Report. This Report must: (a) ascertain whether the construction works created any structural damage to public infrastructure by comparing the results of the Post Construction Dilapidation Report with the Pre -Construction Dilapidation Report required by condition 85 of this consent; (b) have, if it is decided that there is no structural damage to public infrastructure, the written confirmation from the relevant public authority that there is no adverse structural damage to their infrastructure (including roads). (c) be submitted to the Certifier; (d) be forwarded to Council for information; and (e) be provided to the Planning Secretary within 48 hours when requested.	Contractor
		Repair of Public Infrastructure	

D12.		Unless the Applicant and the relevant public authority agree otherwise, the Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out the construction works; and/or (b) relocate, or pay the full costs associated with relocating any infrastructure that needs to be relocated as a result of the development; and/or (c) pay compensation for the damage as agreed with the owner of the public infrastructure. Note: This condition does not apply to any damage to roads caused as a result of general road usage or otherwise addressed by contributions of this consent.	Contractor
		Road Damage	
D13.		Prior to the commencement of operation of the final stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023,, the cost of repairing any damage caused to Council or other Public Authority's assets in the vicinity of the Subject Site as a result of construction works associated with the approved development must be met in full by the Applicant.	Contractor
		Pedestrian Crossings	
D14.		Prior to the commencement of operation of Stage 2 as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the pedestrian crossings on Parkway Avenue identified in the public domain plan provided in the Traffic Impact Assessment prepared by Stantec dated 5 December 2023 must be constructed and available for use. Note: The pedestrian crossing design must be submitted for approval through the Council's Traffic Committee process	Principal
		Roadworks and Pedestrian Infrastructure Upgrades	
D15.		Prior to the commencement of operation of Stage 2 as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the Applicant must complete the roadwork and pedestrian infrastructure upgrade works under condition B27 to the satisfaction of the relevant roads authority.	Contractor
		Post-Construction Survey - Adjoining Properties	
D16.		Where a pre-construction survey has been undertaken in accordance with condition 87, prior to the commencement of operation the Applicant must engage a suitably qualified and experienced expert to undertake a post-construction survey and prepare a Post- Construction Survey Report. This Report must: (a) document the results of the post -construction survey and compare it with the preconstruction survey to ascertain whether the construction works caused any damage to buildings surveyed in accordance with condition 87; (b) be provided to the owner of the relevant buildings surveyed; (c) be provider to the Certifier; and (d) be provided to the Planning Secretary within 48 hours when requested.	Contractor
D17.		Where the Post-Construction Survey Report determines that damage to the identified property occurred as a result of the construction works, the Applicant must repair, or pay the full costs associated with repairing the damaged buildings, within an agreed timeline between the owner of the identified property and the Planning Secretary. Alternatively, the Applicant may pay compensation for the damage as agreed with the property owner.	Contractor
		Bicycle Parking and End-of-Trip Facilities	
D18.		Prior to the commencement of any operation of each relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, compliance with the following requirements for secure bicycle parking and end-of-trip facilities must be submitted to the Certifier: (a) the provision of a minimum 160 visitor/student/staff bicycle parking spaces; (b) the layout, design and security of bicycle facilities must comply with the minimum requirements of the latest version of AS 2890.3:2015 Parking facilities - Bicycle parking, and be located in easy to access, well-lit areas that incorporate passive surveillance; (c) the provision of end-of-trip facilities for staff as detailed in the Traffic Impact Assessment prepared by Stantec dated 6 October 2023 (d) the provision of lockers or storage areas in addition to the end-of-trip facilities, relative to the forecasted number of staff cycling to the site; and (e) appropriate pedestrian and cyclist advisory signs are to be provided. Note: All works/regulatory signposting associated with the proposed development shall be at no cost to the relevant roads authority.	Contractor
		School Zones	
D19.		Prior to the commencement of any operation, all required School Zone signage, speed management signage and associated pavement markings along surrounding streets must be installed, inspected by TfNSW and handed over to TfNSW. Note: Any required approvals for altering public road speed limits, design and signage are required to be obtained from the relevant consent authority.	Contractor
D20.		The Applicant must maintain records of all dates in relation to installing, altering and removing traffic control devices related to speed	Principal
		School Transport Plan	
D21.		Prior to the commencement of any operation, a School Transport Plan (STP), must be submitted to the Planning Secretary for approval. The plan must: (a) be prepared by a suitably qualified consultant in consultation with Council and TfNSW; (b) include arrangements to promote the use of active and sustainable transport modes, including: (i) objectives and modes share targets (i.e. Site and land use specific, measurable and achievable and timeframes for implementation); (ii) specific tools and actions to help achieve the objectives and mode share targets, including a travel access guide and car parking management strategy (iii) details regarding the methodology and monitoring/review program to measure the effectiveness of the objectives and mode share targets, including the frequency of monitoring and the requirement for travel surveys to identify travel behaviours of users of the development. (c) include operational transport access management arrangements, including:	Principal
		Archaeological Salvage - Historic Archaeology	
D22.		The Applicant must prepare an archaeological report of the salvage excavation undertaken in accordance with condition B19 and B20. An interim report of the salvage excavation must be provided to the Certifier for information within one month of completion of the salvage work and a final report provided within 12 months of completion of the salvage work or within another timeframe agreed with the Planning Secretary. Copies of the report must also be provided to the Heritage NSW and Council.	Principal
		Utilities and Services	
D23.		Prior to the commencement of operation for any part of the approved development, a Section 50 Certificate under the Hunter Water Act 1991 must be obtained from Hunter Water for the proposed development.	Contractor
		Stormwater Operation and Maintenance Plan	
D24.		Prior to the commencement of operation, a Stormwater Operation and Maintenance Plan (SOMP) is to be submitted to the Certifier. The SOMP must ensure the proposed stormwater quality measures remain effective and contain the following: (a) maintenance schedule of all stormwater quality treatment devices; (b) record and reporting details; (c) relevant contact information; and (d) Work Health and Safety requirements.	Contractor
		Signage	
D25.		Prior to the commencement of operation of the relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, way-finding signage and signage identifying the location of staff car parking must be installed.	Contractor
D26.		Prior to the commencement of operation, bicycle way-finding signage must be installed within the site to direct cyclists from footpaths to designated bicycle parking areas.	Contractor
		Operational Waste Management Plan	
D27.		Prior to the commencement of operation of each relevant stage, the Applicant must prepare a Waste Management Plan for the development and submit it to the Certifier. The Waste Management Plan must: (a) detail the type and quantity of waste to be generated during operation of the development; (b) describe the handling, storage and disposal of all waste streams generated on site, consistent with the Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014 and the Waste Classification Guideline (Department of Environment, Climate Change and Water, 2009); (c) detail the materials to be reused or recycled, either on or off site; and (d) include the Management and Mitigation Measures included in Appendix P of the RtS.	Principal
		Site Contamination	
D28.		If, based on further site investigations undertaken in accordance with condition C36, it is determined that remediation works are required or ongoing on -site management of soil or groundwater contamination is required, then the following requirements must be satisfied: (a) the Applicant must engage a NSW EPA-accredited Site Auditor to confirm the appropriateness of the site for the proposed use. The Applicant must obtain from a NSW EPA-accredited Site Auditor a Section A2 Site Audit Statement accompanied by an Environmental Management Plan prepared by a certified consultant and submit it to the Planning Secretary and relevant Council for information no later than one month before the commencement of operation. (b) the development must not be used for the purpose approved under the terms of this consent until a Site Audit Statement determines the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with.	Principal
		Landscaping	
D29.		Prior to the commencement of operation of the relevant stage as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, landscaping of the site must be completed in accordance with landscape plans prepared by terras landscape architects listed in condition A2(d).	Contractor
D30.		Prior to the commencement of operation of Stage 2 as identified within the Preliminary Staging Plan prepared by Gyde, dated 25 October 2023, the Applicant must prepare a Landscape Management Plan to manage the revegetation and landscaping on-site and submit it to the Certifier. The plan must: (a) describe the ongoing monitoring and maintenance measures to manage revegetation and landscaping; and (b) be consistent with the Mitigation Measures as revised in the RtS prepared by Gyde dated 27 October 2023.	Contractor
		Operational Flood Emergency Management Plan	

D31.		Prior the commencement of the operation of each relevant stage, an Operational Flood Emergency Management Plan must be submitted to the Certifier that: (a) has been prepared by a suitably qualified and experienced person(s); (b) has been prepared in consultation with NSW State Emergency Service noting the limitations described in the NSW Floodplain Development Manual Appendix N, section N7; (c) incorporates and complies with all advice provided by NSW State Emergency Service at D31 (b); (d) addresses the provisions of the Floodplain Risk Management Guidelines (EHG); (e) incorporates the following: (i) the flood emergency management protocols for operational phase of the development; (ii) a simplified description of flood behaviour, including potential flood levels and associated frequencies within the site and within the adjoining road system and other public land expected to be used by students and visitors; (iii) details strategies such as early or pre-emptive school closure, and other management requirements where relevant and where consistent with SES advice noting that school closure is to be prioritised over shelter in place; (iv) provides clear emergency management triggers and responses, including rainfall and water level, that require closure of the site; (v) details of potential flood warning time and flood notification; (vi) details of shelter-in-place locations, capacity of buildings for shelter-in-place and flood free routes to each shelter-in-place location from main points of the site; (vii) shelter-in-place locations that: • are nominated by a Chartered Professional engineer; • are prepared in consultation with NSW State Emergency Services; • are above the Probable Maximum Flood; • are able to withstand flood and debris forces of the Probable Maximum Flood; and • provide a minimum floor space of 2.5 sqm per person, including students and staff; (viii) identifies clear roles and responsibilities for emergency flood management within the school; (ix) flood warning signs around the site to identify areas with Category H3 hazard and higher, in accordance with the Flood Hazard Flood Risk Management Guide FB03, NSW Department of Planning and Environment and are within the overland flow path; (x) recognise that the NSW SES is the lead combat agency for floods and state that any flood response directive issued by the SES must be followed; (xi) detail the communication strategy, including to staff, parents, students and the community, of site closure before commencement of the school day and during emergency events; (xii) clear requirements that the Plan be regularly reviewed; and (xiii) details of awareness training for employees, contractors, visitors, students and caregivers and induction of new staff members.	Principal
		Heritage Interpretation Plan	
D34.		A Heritage Interpretation Plan to acknowledge the heritage of the site, must be submitted to the Certifier, the plan must: (i) be prepared by a suitably qualified and experienced expert in consultation with the Heritage NSW and Council: (ii) include provision for naming elements within the development that acknowledges the site's heritage, such as the history of the various heritage buildings or potential archaeology uncovered during the works: and (iii) incorporate interpretive information in relation to the use of the site.	Contractor
D32.		A copy of the Flood Emergency Management Plan (required by condition D31) must be provided to the Planning Secretary within 48 hours when requested.	Principal
D33.		The Operational Flood Emergency Management Plan in condition D31 , must be implemented for the lifetime of the development.	Principal
		Structural Inspection Certificate	
D35		Prior to the commencement of operation of each relevant stage, a Structural Inspection Certificate or a Compliance Certificate must be submitted to the Certifier, and submitted to the Planning Secretary for information, which certifies that: (a) the development is structurally adequate for the approved use of the building as a school building; (b) any part of the buildings below the probable maximum flood (PMF) level have been constructed from flood compatible building components; (c) buildings have been constructed to ensure the safe shelter-in-place of vulnerable persons up to the PMF events and after these flood events, until it is safe to leave the buildings, as required by condition B23; and (d) buildings have been constructed so that the part of the building that will be used for egress by those sheltering in place during a PMF event will be safe to be used for this purpose after the flood waters recede from the PMF flood, as required by condition B23	Contractor
D36		A copy of the Certificate(s) required by condition D35, with an electronic set of final drawings (contact approval authority for specific electronic format), must be submitted to the approval authority and the Council after: (a) the site has been periodically inspected and the Certifier is satisfied that the structural works is deemed to comply with the final design drawings; and (b) the drawings listed on the Inspection Certificate have been checked with those listed on the final Design Certificate/s.	Contractor
		APPENDIX 1 ADVISORY NOTES	
		General	
AN1.		All licences, permits, approvals and consents as required by law must be obtained and maintained as required for the development. No condition of this consent removes any obligation to obtain, renew or comply with such licences, permits, approvals and consents.	
		Long Service Levy	
AN2.	**CC1 item 5**	For work costing $250,000 or more, a Long Service Levy must be paid. For further information please contact the Long Service Corporation on 131 441.	Principal / Contractor
		Legal Notices	
AN3.		Any advice or notice to the consent authority must be served on the Planning Secretary.	
		Access for People with Disabilities	
AN4.		The works that are the subject of this application must be designed and constructed to provide access and facilities for people with a disability in accordance with the BCA. Prior to the commencement of construction, the Certifier must ensure that evidence of compliance with this condition from an appropriately qualified person is provided and that the requirements are referenced on any certified plans.	
		Utilities and Services	
AN5.		Prior to the construction of any utility works associated with the development, the Applicant must obtain relevant approvals from service providers.	
AN6.		Prior to the commencement of above ground works written advice must be obtained from the electricity supply authority, an approved telecommunications carrier and an approved gas carrier (where relevant) stating that satisfactory arrangements have been made to ensure provisions of adequate services.	
		Road Design and Traffic Facilities	
AN7.	**Section 138**	All roads and traffic facilities must be designed to meet the requirements of Council or TfNSW (whichever is applicable). The necessary permits and approvals from the relevant road authority must be obtained prior to the commencement of road or pavement construction works.	Contractor
		Road Occupancy Licence	
AN8.		A Road Occupancy Licence must be obtained from the relevant road authority for any works that impact on traffic flows during construction activities.	
		SafeWork Requirements	
AN9.		To protect the safety of work personnel and the public, the work site must be adequately secured to prevent access by unauthorised personnel, and work must be conducted at all times in accordance with relevant SafeWork requirements.	
		Hoarding Requirements	
AN10.		The Applicant must submit a hoarding application to Council for the installation of any hoardings over Council footways or road reserve.	
		Handling of Asbestos	
AN11.		The Applicant must consult with SafeWork NSW concerning the handling of any asbestos waste that may be encountered during construction. The requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 – 'Transportation and management of asbestos waste' must also be complied with.	
		Speed limit authorisation	
AN12.		At least eight weeks prior to the commencement of operation, the Applicant must submit the following details to TfNSW and obtain authorisation to install School Zone signs and associated pavement markings, and / or removal / relocation of any existing Speed Limit signs: (a) a copy of the conditions of consent; (b) the proposed school commencement/opening date; (c) two sets of detailed design plans showing the following: (i) accurate Site boundaries; (ii) details of all road reserves, adjacent to the Site boundaries; (iii) all proposed access points from the Site to the public road network and any additional conditions imposed/proposed on their use; (iv) all existing and proposed pedestrian crossing facilities on the adjacent road network; (v) all existing and proposed traffic control devices and pavement markings on the adjacent road network (including School Zone signs and pavement markings); and (vi) all existing and proposed street furniture and street trees.	
		Fire Safety Certificate	
AN13.		The owner must submit to Council an Annual Fire Safety Statement, each 12 months after the final Safety Certificate is issued. The certificate must be on, or to the effect of, Council's Fire Safety Statement.	
		APPENDIX 2 WRITTEN INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS	
		Written Incident Notification Requirements	
1		A written incident notification addressing the requirements set out below must be emailed to the Planning Secretary through the major projects portal within seven days after the Applicant becomes aware of an incident. Notification is required to be given under this condition even if the Applicant fails to give the notification required under condition A25 or, having given such notification, subsequently forms the view that an incident has not occurred.	

2		Written notification of an incident must: (a) identify the development and application number; (b) provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident); (c) identify how the incident was detected; (d) identify when the applicant became aware of the incident; (e) identify any actual or potential non-compliance with conditions of consent; (f) describe what immediate steps were taken in relation to the incident; (g) identify further action(s) that will be taken in relation to the incident; and (h) identify a project contact for further communication regarding the incident.	
3		Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.	
4		The Incident Report must include: (a) a summary of the incident; (b) outcomes of an incident investigation, including identification of the cause of the incident; (c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and (d) details of any communication with other stakeholders regarding the incident.	

A.15 External Lighting Compliance

ABN 48 612 666 172

Sydney | Brisbane | Melbourne

Level 20, 2 Market St
Sydney NSW 2000

PO Box Q453
Queen Victoria Building
NSW 1230

Ph (02) 9437 1000

28 March 2024

Blackett Maguire + Goldsmith
Level 1, 138-140 Beaumont Street
Hamilton NSW 2303

CERTIFICATE OF DESIGN – ELECTRICAL SERVICES

SUBJECT PREMISES: Newcastle Education Campus, 160/200 Parkway Avenue, Hamilton South NSW 2303

Pursuant to the provisions of **Clause A5.2 of the Building Code of Australia**, I hereby certify that the above installation shall be peer reviewed in accordance with the requirements of the Building Code of Australia and relevant Australian Standards. In particular, the design from the subcontractor shall be in accordance with the following:

NCC-2019 Amendment 1	
NCC-2019 Amendment 1	Energy efficiency Part J6, Part J8;
AS1680.2.3:2008	Interior and Workplace Lighting - Specific applications- Educational and training facilities
AS/NZS 2293.1-2018	Exit signage & emergency lighting;
AS3000-2018	Wiring rules;
AS1158.3.1:2005	Lighting for Roads and Public Spaces – Pedestrian area (Category P) lighting
AS4282-2019	Control of the Obtrusive Effects of Outdoor Lighting
Relevant Conditions of the SSD - 41814831	B14 iv)
AS1170.4	Section 8
Fire Engineering Report	301351018-FE-FEBQ-NCE-V01 Version 1, 6th April 2023, Stantec Australia Pty Ltd
Section J Report	220263 NEC New Learning Hub – Section J [B], 14th April 2023, JHA
Section J Report	220263 NEC Multipurpose Facility – Section J [B], 14th April 2023, JHA

Full Name of Designer:	Christopher Taylor
Qualifications:	BE (Electrical) (Hons)
Address of Designer:	Level 20, 2 Market Street Sydney NSW 2000
Business Telephone No:	(02) 9437 1000
Name of Employer:	JHA Consulting Engineers

Yours sincerely,

Christopher Taylor
Senior Electrical Engineer

A.16 Site Layout Plan

Legend of Symbols

- External Perimeter Site Boundary (Type A Fencing)
- Vehicle Gate
- Pedestrian P/A Gate
- HY Statutory Project Site Signage Board
- Laydown Zone
- Site Emergency Evacuation Muster Point
- Internal Site Vehicle Main Path / Road
- Vehicle Access into Project Site
- Vehicle Egress out of Project Site
- Emergency Services Vehicle main Access to / Egress from Project Site
- OH&S First Aid Room with Defrib
- T(m/f) — Site Toilets (m=male. f=female)
- L — Site Lunchrooms
- HY — Site Offices Hansen Yuncken
- CR — Site Offices Hansen Yuncken
- Site Container
- Fire Fighting Equipment
- Water Point (non potable)
- Spill Kit
- Evacuation Siren Location
- Main Site Bins / resource recovery
- Site Personnel Entry / Exit / Travel Routes
- Sediment Control Fencing
- Cattle Grate
- Tree Protection Zone
- Tree Protection Zone Fencing
- Hoarding

HY SITE MANAGEMENT & OHS&W PLANNING

Full Site Layout

North

Revision: 2
Rev Date: 12/02/24

160/200 Parkway Avenue, Hamilton South, NSW 2303

NEWCASTLE HIGH SCHOOL REDEVELOPMENT

HANSENYUNCKEN

A.17 Community Consultation Strategy

School Infrastructure NSW

Community Communication Strategy

Newcastle High School redevelopment

(Formerly Newcastle Education Campus)

SSD-41814831

March 2024

Version	Date of Review
1.0	4/04/2024

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Document purpose

School Infrastructure NSW (SINSW) consults and engages with communities and stakeholders throughout the development of a school project. This engagement helps to inform the design of the school project and provides an opportunity to share and address potential constraints and impacts during construction.

A Consultation Report outlining the consultation and engagement during this planning phase of the project is submitted as part of the State Significant Development (SSD) application. This Community Communications Strategy (CCS) provides an overview of how SINSW will continue to communicate and consult with the community during construction of the project.

The Newcastle High School redevelopment (formerly referred to as Newcastle Education Campus) is classified as a State Significant Development, and has been assessed by the Department of Planning, Housing and Infrastructure (DPHI). Consent was provided on Friday 12 January 2024.

To view the SSD, including the Consultation Report, visit the DPHI planning portal at www.planningportal.nsw.gov.au/major-projects/projects/newcastle-education-campus.

This CCS has been developed to Comply with condition B9 of the SSD consent:

Community Communication Strategy

B9. No later than 48 hours prior to the commencement of construction, a Community Communication Strategy must be submitted to the Planning Secretary for information. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development, and for a minimum of 12 months following the completion of construction.

The Community Communication Strategy must:

(a) identify people to be consulted during the design and construction phases;
(b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;
(c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;
(d) set out procedures and mechanisms:
  (i) through which the community can discuss or provide feedback to the Applicant;
  (ii) through which the Applicant will respond to enquiries or feedback from the community; and
  (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.
(e) include any specific requirements around traffic, noise and vibration, amenity, tree retention, heritage.

This CCS outlines SINSW's commitment to:

- Consider and manage stakeholder and community expectations as integral to the successful delivery of the project.
- Inform affected stakeholders, such as the local community or road users about construction activities.
- Enable the open and proactive management of issues and communications.

This CCS will be implemented through the construction phase of the project, and for 12 months following construction completion.

Plan review

The CCS will be revised as required to address any changes in stakeholders or the project management or complaints handling process. This will be done in close consultation with the SINSW Senior Project Director, appointed Project Management company and/or Contractor and SINSW Community Engagement Manager.

Approval

The CCS is reviewed and approved by the SINSW Senior Project Director, in close consultation with relevant members of the Department of Education's School Performance team that may include a Director Educational Leadership or school Principal. Final endorsement is provided by the SINSW Senior Manager, Community Engagement.

Table 1: List of SSD requirements and where they are addressed in this CCS

State Significant Developments SSD-41814831 **B9**	**The Community Communications Strategy addresses this in section**
a) identify people to be consulted during the design and construction phases;	▪ Section 3
b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;	▪ Section 4
c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;	▪ Section 4
d) set out procedures and mechanisms: *i. through which the community can discuss or provide feedback to the Applicant;* *ii. through which the Applicant will respond to enquiries or feedback from the community;* *iii. to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.*	▪ Section 6
e) include any specific requirements around traffic, noise and vibration, tree retention, heritage.	▪ Section 7

1. Context

The Newcastle High School redevelopment includes staged upgrades comprising of:

- demolition (Buildings B, D, E, I, J and P), relocation (Building H) and refurbishment of existing buildings A and K.
- construction of new buildings (new learning hub and multipurpose facility), covered walkways, campus green, drop-off/pick-up, waste and sporting facilities
- tree removal and landscaping
- ancillary works including public domain infrastructure.

For more information on the project, visit the project webpage on the School Infrastructure NSW website.

2. Community engagement objectives

SINSW's goal is that our school infrastructure meets the needs of a growing population and enables flexible learning and teaching. This CCS has been developed to achieve the following community engagement objectives:

a) Promote the benefits of the project

b) Build key school community stakeholder relationships and maintain goodwill with impacted communities

c) Manage community expectations and build trust by delivering on our commitments

d) Provide timely information to impacted stakeholders, schools and broader communities

e) Address and correct misinformation in the public domain

f) Reduce the risk of project delays caused by negative third party intervention

g) Leave a positive legacy in each community.

3. Stakeholders

The stakeholder list below summarises who will be informed and consulted during the construction phase via ongoing face to face meetings, communications collateral and digital engagement methods.

Table 2: Stakeholders

Stakeholders	Interest and involvement
Newcastle High School community ▪ Principal ▪ Teachers ▪ Staff ▪ Parents and carers ▪ Students ▪ Newcastle High School P&C	▪ Construction impacts and how these will be minimised ▪ Safe pedestrian and traffic access to the school ▪ Parking, drop-off and pick-up considerations ▪ Quality of infrastructure and resources upon project completion ▪ How to access the new school once completed ▪ Understanding of the timing for construction, use of the temporary school, and how students will transition from the temporary to the permanent school. ▪ Available play space for students ▪ Awareness of intake area for the new school

Stakeholders	Interest and involvement
Local community Residents and property owners of: ▪ National Park Street ▪ Parkway Avenue ▪ Smith Street ▪ Dumaresq Street	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities
Adjoining affected landowners and businesses ▪ Newcastle No. 2 Sportsground, Smith Street ▪ Newcastle and Hunter Rugby Union, Cnr Parry and Smith Streets ▪ Newcastle Netball Association, Union Street ▪ 1st Merewether Scout Hall, Smith Street ▪ Fearnley Dawes Athletic Centre, 120 Smith Street	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities ▪ Environmental impacts during construction ▪ Public domain upgrades e.g. footpaths
Local Members of Parliament: ▪ Mr (Tim) Timothy Crakanthorp MP, State Member for Newcastle ▪ Ms Sharon Claydon MP, Federal Member for Newcastle	▪ Meeting the economic, social and environmental objectives of state and federal governments ▪ Delivering increased public education capacity on time ▪ Delivering infrastructure which meets expectations ▪ Addressing local issues such as traffic, congestion and public transport solutions
Government agencies and peak bodies: ▪ Transport for NSW ▪ Fire and Rescue NSW ▪ NSW Department of Planning, Housing and Infrastructure ▪ NSW Environmental Protection Authority ▪ NSW Rural Fire Service ▪ Hunter Water ▪ NSW Heritage Council ▪ NSW Department of Premier and Cabinet	▪ Traffic and congestion on the local road system ▪ Adequate public transport options and access ▪ Ensuring new infrastructure meets standard requirements for safety and fire evacuation ▪ Ensuring the development is compliant ▪ Ensuring the development does not impact heritage items ▪ Management of any contamination
Local Council – City of Newcastle ▪ Lord Mayor, Nuatali Nelmes ▪ Councillors ▪ Chief Executive Officer, Jeremy Bath	▪ Schedule for construction and opening of school ▪ Impacts to the local community including noise, congestion and traffic ▪ Shared use of community spaces ▪ Providing amenities to meet increase population density ▪ Copies of information distributed to local residents ▪ Processes and protocols in place to manage

Stakeholders	Interest and involvement
	interactions with local residents
Nearby public schools ▪ Newcastle High School (Cooks Hill campus) ▪ Newcastle East Public School ▪ The Junction Public School ▪ Hamilton South Public School ▪ Merewether Public School ▪ Hamilton Public School	▪ Impact on school resources ▪ Impact on current students ▪ Implications for teaching staff ▪ Possible impacts on enrolments ▪ Opportunities to view the new facilities
Community groups ▪ Newcastle Boys High School Old Boys Association ▪ From Central to Hunter Ex-Students' Association ▪ Newcastle Girls High School Ex-Students Union	▪ Construction impacts and how these will be minimised ▪ Impacts of project on existing infrastructure and public transport capacity ▪ Impacts of project on school heritage and history ▪ Quality of infrastructure and resources upon project completion ▪ How to access the new school once completed ▪ Understanding of the timing for construction ▪ Available play space for students ▪ Awareness of intake area for the new school/changes to intake area for upgrades
Project Status Update Group (names not disclosed) • Project members • School Principal • Director Educational Leadership	• Construction progress • Operational impacts from construction schedule
Registered/Interested Aboriginal Parties • Awabakal Local Aboriginal Land Council • Aboriginal Education Consultative Group • Muloombinbah Local Aboriginal Education Consultative Group • Registered Aboriginal Parties • Members of the local Aboriginal community including Mrs Barbara Greentree, Luke Russell, Cherie Johnson, Dominic Dates, Callan Nickerson, Aunty Belinda Wright, Amy Lalic, Nathan Towney and Madison Piercy.	• Walk on Country, design discussion and Smoking Ceremony prior to the sod turn • Recognition and respect for Aboriginal heritage and culture

4. Engagement approach

The key consideration in delivering successful outcomes for this project is to make it as easy as possible for anyone with an interest to find out what is going on. In practice, the communications approach across all levels of engagement will involve:

a) Using uncomplicated language

b) Taking an energetic approach to engagement

c) Encouraging and educating whenever necessary

d) Engaging broadly including with individuals and groups that fall into harder to reach categories

e) Providing a range of opportunities and methods for engagement

f) Being transparent

g) Explaining the objectives and outcomes of planning and engagement processes.

In addition to engagement with government departments, agencies and Council, community engagement will continue for the project during construction in two streams:

a) School-centric involvement from school communities (including students, parents/caregivers, teachers, administration staff) unencumbered by broader community issues, and

b) Broad community involvement unencumbered by school community wants and needs. Broad community stakeholders include local residents, neighbours and local action groups.

4.1. General community input

Members of the general public impacted by the construction phase are able to enquire, provide feedback and complain about environmental impacts via the following channels:

a) School Infrastructure NSW 1300 community information line (1300 482 651) that is published on all communications material, including project site signage

b) School Infrastructure NSW email address (schoolinfrastructure@det.nsw.edu.au) that is published on all communications material, including project site signage

c) Project webpage 'contact us' form

d) During information booths and information sessions held at the school or local community meeting place, and advertised on our website and via letterbox drops.

Refer to Section 6.5 of this document for detail on our enquiries and complaints process. The contractor contact details for after hours complaints and enquiries are available in the Construction Environment Management Plan which can be found in the Reports section in the project webpage library.

A number of tools and techniques will be used to keep stakeholders and the local community involved as summarised in Table 3 below.

For reference, project high level milestones during the delivery phase include:

a) Site establishment

b) Commencement of main works construction

c) School Term prior to project completion

d) Project completion

e) First day of school following project completion / official opening

Table 3: School Infrastructure NSW Communications Tools

Communications Tool	Description of Activity	Frequency
1300 community information line	The free call 1300 482 651 number is published on all communication materials and is manned by SINSW. All enquiries that are received are referred to the appointed Community Engagement Manager and/or Senior Project Director as required and logged in our CRM. Once resolved, a summary of the conversation is updated in the CRM.	Throughout the life of the project and accessible for 12 months post completion
Advertising (print)	Advertising in local newspapers may be undertaken prior to significant construction activities, major disruptions and opportunities to meet the project team or find out more at a face to face event.	At project milestones
Call centre scripts	High level, project overview information may be provided to external organisations who may receive telephone calls enquiring about the project, most namely stakeholder councils.	Throughout the project when specific events occur or issues are raised by stakeholders
Community contact cards	These are business card size with all the SINSW contact information. The project team / contractors are instructed to hand out contact cards to stakeholders and community members enquiring about the project. Cards are offered to school administration offices as appropriate. Directs all enquiries, comments and complaints through to our 1300 number and School Infrastruture NSW email address.	Throughout the life of the project and available 12 months post completion
CRM database	All projects are created in SINSW's Customer Relationship Management system at project inception. Interactions, decisions and feedback from stakeholders are captured, and monthly reports generated. Any enquiries and complaints are to be raised in the CRM and immediately notified to the Senior Project Director, Project Director and Community Engagement Manager.	Throughout the life of the project and updated for 12 months post completion
Display boards	A0/A1 size full colour information boards to use at info sessions or to be permanently displayed in appropriate places (school admin office for example).	As required
Door knocks	Provide timely notification to nearby residents of upcoming construction works, major impacts such as changes to pedestrian movements, temporary bus stops, expected impacts and proposed mitigation. Provide written information of construction activity and contact details.	As required prior to periods of significant construction impacts
FAQs	Set of internally approved answers provided in response to frequently asked questions. Used as part of relevant stakeholder	Throughout the life of the project

Communications Tool	Description of Activity	Frequency
	and community communication tools. These are updated as required, and included on the website if appropriate.	
Information booths	Information booths are held locally and staffed by a project team member to answer any questions, concerns or complaints on the project. Information booths may be held both at the school/ neighbouring school, as well as for the broader community: a) School information booths are held at school locations at times that suit parents and caregivers, with frequency to be aligned with project milestones and as required. b) Community information booths are usually held at local shopping centres, community centres and places that are easily accessed by the community. They are held at convenient times, such as out of work hours on weekdays and Saturdays. Collateral to be provided include community contact cards, latest project notification or update, with internal FAQs prepared. All liaison to be summarised and loaded in the CRM.	At project milestones and as required
Community information sessions	Information sessions are a bigger event than an info booth, held at a key milestone or contentious period. We have more information on the project available on display boards / screens and an information pack handout – including project scope, planning approvals, any impacts on the school community or residents, project timeline, FAQs. Members from the project and communications team will be available to answer questions about the project. These events occur after school hours on a week day. All liaison summarised and loaded on the CRM.	As required
Information pack	A 4 page A4 colour, fold out flyer that can include information about the project scope, progress, FAQs, timeline and next steps. To be distributed at info sessions or at other bigger events / milestones in hard copy and also made available electronically.	As required
Media releases/events	Media releases are distributed upon media milestones. They promote major project milestones and activities and generate broader community awareness.	Media milestones during construction period may include: a) Planning approval granted b) Construction contract tendered c) Construction contract awarded d) Sod turning opportunity e) Handover / Official

Communications Tool	Description of Activity	Frequency
		opening
Notifications and updates	A4 printed in colour that can include FAQs if required. Notifications are distributed under varying templates with different headings to suit different purposes: a) **Works notification** are used to communicate specific information/ impacts about works, impacts and mitigations. b) **Project update** is used when communicating milestones and higher level information to the wider community i.e. project announcement, concept design, DA lodgement, construction award, completion. Includes the project summary, information booths / sessions if scheduled, progress summary and contact information.	As required according to the construction program. Distributed (refer construction works notification distribution methodology in Section 4.2) via letterbox drop to local residents and via the school community prior to construction activities or other milestones throughout the life of the project. Specific timings indicated in table 5.
Photography and videography	Images may be used in notifications, on the website, at information sessions and in presentations. Once the project is complete, SINSW will organise photography of external and internal spaces to be used for a range of communications purposes.	Project completion (actual photography and video of completed project). Prior to project completion - artist impressions, flythrough, site plans and contruction progress images may be used.
Presentations	Details project information for presentations to stakeholder and community groups.	As required
Priority correspondence	Ministerial (and other) correspondence that is subject to strict response timeframes. Includes correspondence to the Premier, Minister, SINSW and other key stakeholders. SINSW is responsible for drafting responses as requested within the required timeframes.	As required
Project Reference Group	SINSW facilitated Project Reference Group sessions providing information on the design, construction activities, project timeframes, key issues and communication and engagement strategies.	Meets every school term or as required.
Project Status Update Group	The Project Status Update Group (PSUG) commences once construction begins and during Schematic Design. It is a forum for project teams to communicate changes from previous design phases. Its primary purpose is the sharing of information between the project team and school regarding operational impacts from the construction schedule.	Meets in week 6 of every school term once construction has commenced to allow for planning of the following school term

Communications Tool	Description of Activity	Frequency
Project signage	A0/A1 sized, durable aluminium signage will be installed at a suitable location on the construction site fencing. Provides high level information including project scope, project image and SINSW contact information.	Throughout the life of the project and installed for 12 months post completion
Site visits	Demonstrate project works and progress and facilitate a maintained level of interest in the project. Includes media visits to promote the reporting of construction progress.	As required
School Infrastructure NSW email address	Provide stakeholders and the community an email address linking direct to the Community Engagement team. Email address (schoolinfrastructure@det.nsw.edu.au) is published on all communications materials.	Throughout the life of the project
School Infrastructure NSW website	A dedicated project page for Newcastle High School redevelopment is located on the SINSW website – https://www.schoolinfrastructure.nsw.gov.au/projects/n/newcastle-high-school-revdevelopment.html	Updated at least monthly and is live for at least 12 months post completion of the project
Welcome pack/ thank you pack	At project completion the following flyers are utilised: ▪ **Welcome pack** – project completion for school community provided on the first day/week they are returning to school when new facilities are opening, or attending a new school. Includes project overview, map outlining access to the school and key locations, FAQs, contact information. ▪ **Thank you pack** – tailored to the local residents to thank them for their patience and support of the project.	Project completion only

4.2. Construction works notification distribution methodology

Construction works notifications will be distributed to targeted properties in the vicinity of the project. These properties have been identified as part of the technical studies and plans submitted as part of the planning and assessment approval pathway and post approval requirements. Specifically, the notification distribution map at **Figure 1** below has been prepared through an analysis of the potential project impacts and requirements identified in:

- the Noise and Vibration Impact Assessment submitted with the SSD application
- the Traffic Impact Assessment submitted with the SSD application
- the Construction Worker Transportation Strategy
- the Construction Environmental Management Plan, including the:
    - Construction Noise and Vibration Management Sub Plan
    - Construction Traffic and Pedestrian Management Sub Plan.

This methodology has been used to identify the anticipated construction impacts identified for this project. It does not include an arbitrary distribution area due to the robust impact analysis that has been carried out during planning and assessment phase of the project.

The distribution area may be altered:

- to address specific construction activities where the impact/s affect fewer or greater properties, depending on the nature of the work
- where ongoing monitoring shows more widespread impacts to that predicted in the environmental impact assessment
- if complaints are received outside of the distribution area
- if there is an approved project modification in the future that results in more widespread impacts

- at the discretion of School Infrastructure NSW.

Additional project updates and notifications will also be distributed when communicating milestones and higher-level information to the wider community such as construction contract award and project completion. Such updates and notifications may not detail construction impacts and may be distributed to a greater number of addresses to widely publicise the project's achievements.

The below details the nearest sensitive receivers that may be impacted by construction including noise. The properties within all shaded areas including the school will receive notifications for unplanned out of hours works before undertaking the activities or as soon as is practical afterwards. This will also consider residents that may be impacted by heavy vehicle movements and other non site specific impacts (e.g. truck movements).

Figure 1: Map of construction works with notification distribution areas enclosed

Figure 2: Map of vehicle movements

Vehicle routes including National Park Street and Smith Street.

5. Engagement Delivery Timeline

The following engagement delivery timeline maps tailored communications tools and activities by key milestone.

Table 4: Engagement timeline

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
Prior to SSD approval – consultation during planning and design development	All local stakeholders and residents	Consultation Report submitted as part of SSD	Completed
SSD approval – consult community on construction mitigation measures	Local residents	Works notification Distributed through letter box drop	Completed
Site Establishment	Local community, including across the new high school intake area High school community, including principal, teachers, staff, and P&C Adjoining property owners Local Council Member for Newcastle Aboriginal Elders	Project Update, Works Notifications, and Project signage. Distributed through letter box drop, school newsletter and social media. Onsite sod turn event, smoking ceremony	Completed
Main Construction works including but not limited to: a) Remediation (if occurs) b) Works commenced c) Key impact periods – noise, dust, traffic, vibration	Local community, including across the new high school intake area Newcastle High School community, including principal, teachers, staff, P&C and parents/carers Adjoining property owners	Works Notifications, and Project signage. Distributed through letter box drop, school newsletter and social media. Information booth if deemed required.	Throughout construction
Term prior to project completion	Local community, including across the new high school intake area Newcastle High School community, including principal, teachers, staff, and P&C Adjoining property owners Local Council	Project Update, Media Release Distributed through letter box drop, school newsletter and social media Information session, site tours if required by school leadersip.	TBC

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
	PSA and NSW Teachers' Federation		
Handover [and welcome to new school facilities]	Local community, including across the new high school intake area Adjoining property owners Local Council	Project Update, media release Distributed through letter box drop, school newsletter and social media	TBC
Opening of new high school facilities /Completion of project	Local community, including across the new high school intake area New high school community, including principal, teachers, staff, and P&C Newcastle High School community including students, teachers, staff, and parents/carers Adjoining property owners Poplars management QPRC (Customer & Communication Service Manager)	Official opening ceremony, Welcome Pack, Welcome Team, media release Distributed through letter box drop, school newsletter and social media.	TBC
Post-opening, for 12 months following operation	All	Website remains live Project signage remains installed 1300 phone and email still active, and CRM still maintained for complaints and enquiries.	TBC (at least 12 months post construction completion)

6. Protocols

6.1. Media engagement

SINSW manages all media relations activities, and is responsible for:

a) Responding to all media enquiries and instigating all proactive media contact.

b) Media interviews and delegation to SINSW media spokespeople who are authorised to speak to the media on behalf of the project

c) Informing the Minister's Office and SINSW project team members and communications representatives of all media relations activities in advance and providing the opportunity to participate in events where possible.

6.2. Site visits

SINSW, in partnership with the Department of Education Schools Performance, organises and hosts guided project site tours and media briefings as required by the Minister's Office. The Project Team will ensure the required visitor site inductions are undertaken and that all required Personal Protective Equipment (PPE) is worn.

For media site visits and events, SINSW creates, or contributes to, the production of an event pack. This will include an event brief, media release, speaking notes and Q&As.

6.3. Social, online and digital media

SINSW initiates and maintains all social and online media channels. These channels may include the Department's Facebook and Twitter, and SINSW's LinkedIn and website. SINSW will also work to coordinate social media posts with the schools' social media accounts.

6.4. Stakeholder and community notification process

Notification letters or project updates will be distributed to the community and stakeholders in advance of any activity with the potential to cause impacts.

Depending on the work activity and stakeholder, notifications are primarily distributed via letterbox drop, via the school, electronically via email, as well as uploaded to the SINSW project webpage. If appropriate, notification may also be delivered in person via door knocks, or via phone call or text message, or one-on-one briefings.

Notifications will be written in plain English and will:

- outline the reason that the work is required
- outline the location, nature, and duration of the proposed works
- outline date/s of work, where practicable
- outline work hours
- include a diagram that clearly indicates the location of the works, where required
- include a 1300 community contact number, project email address and website details
- Provide details for a translation service, where required.

Table 5 below outlines minimum notification periods that will be targeted for work activities with the potential to impact sensitive receivers. All notification periods prescribed within development approvals or by approving bodies will be adhered to.

Regular construction updates regarding the general work program and significant milestones will also be provided to the school community and neighbouring properties throughout construction.

The contractor will provide SINSW with the information necessary to meet the notification requirements and target timeframes contained, where practicable.

Table 5: Target community notification periods

Notification period	Work activity
Same day (or as soon as practical)	Major incident, emergency works
	Unplanned out of hours work (notification provided to affected residents by the contractor before undertaking the works or as soon as practical)
	Unexpected hazardous material find or incident (e.g. asbestos, lead, chemical spill or other harmful material)
7 days	Start of works or site establishment
	Works outside of the site boundary
	Planned out of hours work or change to approved work hours
	Planned investigation and remediation of hazardous materials including asbestos
	Phase of high noise generating works including demolition, tree removal, rock breaking, rock hammering, piling or similar
	Major traffic or pedestrian access changes including parking impacts, detours, and road diversions/closures
	Operational changes for the school community including to school drop-off points, entry and exit points, bus stops, and play space
3 months	Major impacts to school community, including relocation to temporary school, changes to student intake area or similar

6.5. Enquiries and complaints management

SINSW manages enquiries (*called interactions in our Customer Relationship Management (CRM) software, Darzin*), and complaints in a timely and responsive manner.

Prior to project delivery, a complaint could be related to lack of community consultation, design of the project, lack of project progress, etc.

During project delivery (construction), a complaint is defined as in regards to construction impacts – *such as* – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers, other environmental impacts, unplanned or uncommunicated disruption to the school.

If a phone call, email or face-to-face complaint is received during construction, it will be acknowledged within 2 working days and logged in our CRM, actively managed, closed out and resolved by SINSW within 10 days, where practicable. Where complaints are unable to be resolved within this timeframe the complainant will be provided with regular updates regarding the complaint resolution process.

A 24-hour contact number for the project site manager will be displayed at the site and can be shared with the community as necessary for any urgent issues that need to be addressed on site, outside of business hours.

The contractor site manager contact details are available on the project webpage at page 16 of the Construction Environment Management Plan.

As per the project's planning approval conditions, a complaints register is updated monthly, or as required by the planning authority, and is publicly available on the project's webpage on the SINSW website.

If the complainant is not satisfied with SINSW's response, and they approach SINSW for rectification, the process will involve a secondary review of their complaint as per the outlined process.

Complaints will be escalated when:

- An activity generates three complaints within a 24-hour period (separate complainants).
- Any construction site receives three different complaints within a 24-hour period.
- A single complainant reports three or more complaints within a three-day period.
- A complainant threatens to escalate their issue to the media or government representative.
- The complaint was avoidable.
- The complaint relates to a compliance matter.
- The complaint relates to a community safety matter.
- The complaint relates to a property damage claim.

Complaints will be first escalated to the Senior Manager, Community and Engagement or Director of Communications for SINSW as the designated complaints handling management representatives for our projects. Further escalation will be made to the Executive Director, Office of the Chief Executive to mediate if required.

If a complaint still cannot be resolved by SINSW to the satisfaction of the complainant, we will advise them to contact the NSW Ombudsman - https://www.ombo.nsw.gov.au/complaints.

Table 6 below outlines target timeframes for responding to enquiries and complaints, through each correspondence method:

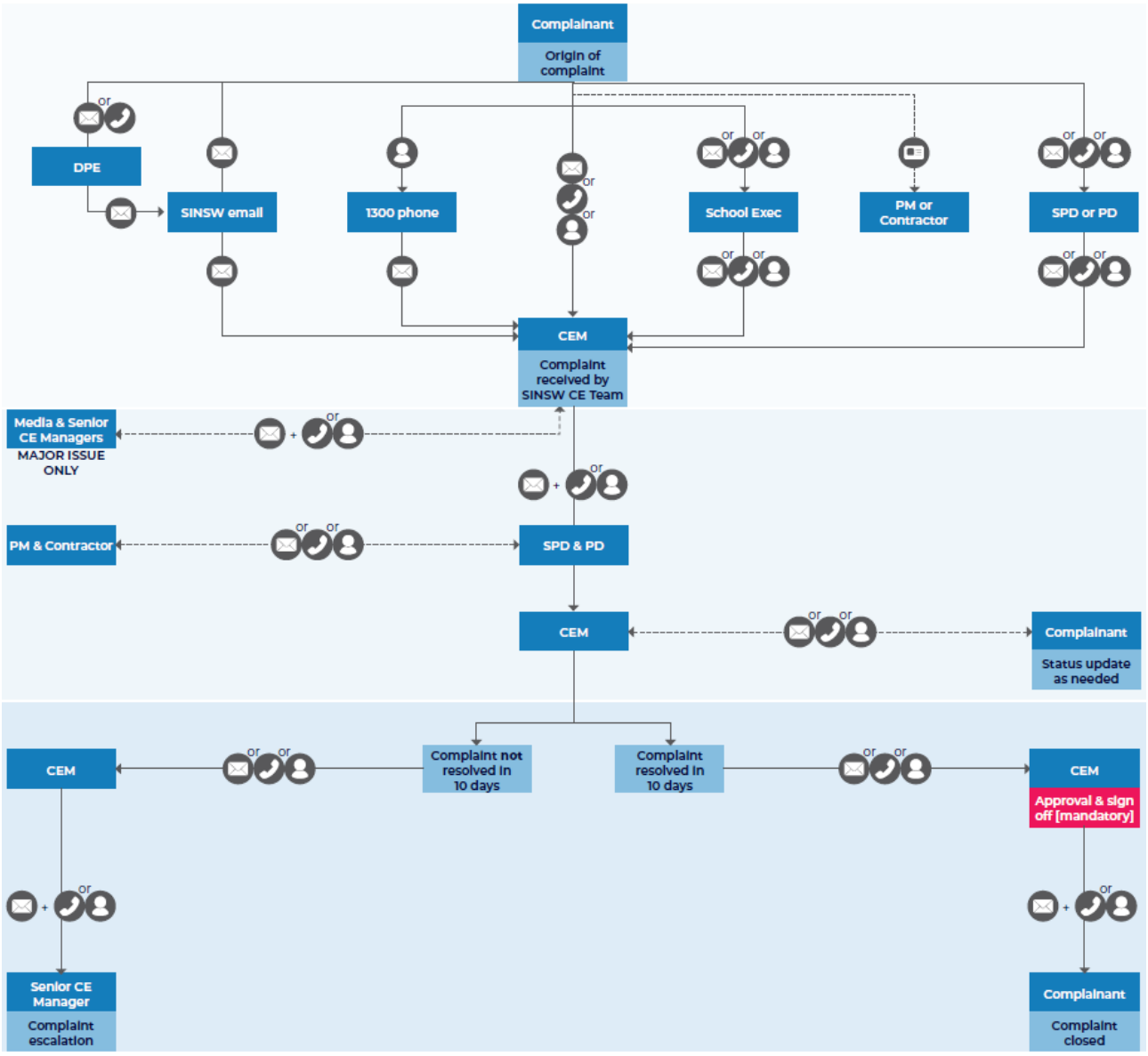
Table 6: Complaint and enquiry response time

Complaint	Acknowledgement times	Response times
Phone call during business hours	At time of call.	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Phone call after hours*	Within two (2) hours of receiving message upon returning to office.	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Email during business hours	At time of email (automatic response)	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Email outside of business hours	At time of email (automatic response)	Complaint to be closed out within 10 days, where practicable. If not possible, continue contact, escalate internally as required, and provide the complainant with regular updates until resolved.
Interaction/ Enquiry		
Phone call during business hours	At time of call.	Interaction to be logged and closed out within 10 days, where practicable.

Complaint	Acknowledgement times	Response times
Phone call after hours	Within two (2) hours of receiving message upon returning to office.	Interaction to be logged and closed out within 10 days, where practicable.
Email during business hours	At time of email (automatic response)	Interaction to be logged and closed out within 10 days, where practicable.
Email outside of business hours	At time of email (automatic response)	Interaction to be logged and closed out within 10 days, where practicable.
Letter	N/A	Interaction to be logged and closed out within 10 days following receipt, where practicable.

The below diagram outlines our internal process for managing complaints.

Figure 3 - Internal Complaints Process



6.5.1. Disputes involving compensation and rectification

School Infrastructure NSW is committed to working with the school and broader community to address concerns as they arise. Where disputes arise that involve compensation or rectification, the process for resolving community enquiries and

complaints will be followed to investigate the dispute. Depending upon the results of the investigation, School Infrastructure NSW may seek legal advice before proceeding.

6.6. Incident management

An incident is an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. Material harm is harm that:

(a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; *or*

(b) results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment).

6.6.1. Roles and responsibilities following an incident

In the event of an incident, once emergency services are contacted (if appropriate), the incident must be immediately reported to the SINSW Senior Project Director who will inform:

a) SINSW Director

b) SINSW Community Engagement Manager

SINSW Community Engagement Manager will inform:

a) SINSW Senior Manager, Community Engagement
b) SINSW Communications Director

SINSW Communications Director will:

a) Advise the SINSW Communications Director who will lead and manage all communications with the Minister's office in the event of an incident, with assistance as required

b) Direct all communications with media to the SINSW Media Manager in the first instance for management

c) Notify all other key project stakeholders of an incident.

The SINSW Senior Project Director will issue a written incident notification to Department of Planning, Housing and Infrastructure (DPHI) Planning Secretary immediately following the incident to set out the location and nature of the incident.

This must be followed within seven days following the incident of a written notification to the Department of Planning, Housing and Infrastructure that:

(a) identifies the development and application number;

(b) provides details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);

(c) identifies how the incident was detected;

(d) identifies when SINSW became aware of the incident;

(e) identify any actual or potential non-compliance with conditions of consent;

(f) describes what immediate steps were taken in relation to the incident;

(g) identifies further action(s) that will be taken in relation to the incident; and

(h) provides the contact information for further communication regarding the incident.

Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, SINSW will provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.

The Incident Report must include:

(a) a summary of the incident;

(b) outcomes of an incident investigation, including identification of the cause of the incident;

(c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and

(d) details of any communication with other stakeholders regarding the incident.

6.7. Reporting process

Throughout the project, data will be recorded on participation levels both face to face and online, a record of engagement tools and activities carried out in addition to queries received and feedback against emerging themes.

Stakeholder and community sentiment will be evaluated throughout to ensure effectiveness of the engagement strategy and to inform future activities.

Reporting will include but not be limited to:

a) Stakeholder engagement reporting – numbers of forums, participation levels and a summary of the outcomes Community sentiment reporting – outputs of all community engagement activities, including numbers in attendance at events, participation levels and feedback received against broad themes

b) Online activity – through the project website.

7. Specific requirements

7.1. Traffic

The construction contractor has developed a Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) that details the measures that will be implemented to ensure road safety and network efficiency during construction. The CTPMSP includes the following measures:

- Site personnel will be stationed at the site entry and exit gates to ensure pedestrian safety and manage and assist construction vehicles entering to and exiting from the site.
- Road signage will be installed along surrounding streets to warn drivers approaching the site location of construction vehicles entering and exiting the site.
- Construction vehicles will radio/call the site office on approach to ensure a loading area is available within the site.
- All loading and unloading activities will be undertaken within the work site.
- Major deliveries will be scheduled to avoid the school peak drop-off and pick-up times.
- Heavy vehicle drivers will be required to adhere to the nominated transport routes.
- Drivers will be asked to leave the site in a suitable traffic gap (vehicles already on the public road have the right-of-way and must not be stopped).
- Construction workers will be encouraged and expected to use public transport to travel to/from the site. This will be incorporated in the workers induction program at the beginning of the construction period.

7.2. Noise and vibration

All works will be conducted in accordance with the project's Construction Noise and Vibration Management Sub-Plan (CNVMSP). Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

a) between 7am and 6pm, Mondays to Fridays inclusive; and

b) between 8am and 1pm, Saturdays.

No work may be carried out on Sundays or public holidays.
Provided noise levels do not exceed the existing background noise level plus 5 decibels, works may also be undertaken during the following hours:

c) between 6pm and 7pm, Mondays to Fridays

d) between 1pm and 4pm, Saturdays

Construction activities may be undertaken outside of the hours in condition C4 and C5 if required:

(e) by the Police or a public authority for the delivery of vehicles, plant or materials; or

(f) in an emergency to avoid the loss of life, damage to property or to prevent

(g) environmental harm; or

(h) where the works are inaudible at the nearest sensitive receivers; or

(i) for the delivery, set-up and removal of construction cranes, where notice of the

(j) crane-related works is provided to the Planning Secretary and affected residents at

(k) least seven days prior to the works; or

(l) by the relevant roads authority or utilities service provider in order to minimise

(m) disruption to the roadway or essential services, where the related works have been

(n) provided to the Planning Secretary and affected residents at least seven days prior

(o) to the works; or

(p) where a variation is approved in advance in writing by the Planning Secretary if appropriate justification is provided for the works.

Notification of such construction activities will be given to affected residents before undertaking the activities or as soon as is practical afterwards.

Rock breaking, rock hammering, sheet piling, pile driving and similar activities will only be carried out between the following hours:

- 9am to 12pm, Monday to Friday;
- 2pm to 5pm Monday to Friday; and
- 9am to 12pm, Saturday.

The development will be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures will be implemented and any activities that could exceed the construction noise management levels will be identified and managed in accordance with the management and mitigation measures identified in the approved CNVMSP.

7.3. Amenity

All works will be undertaken in accordance with the project's Construction Environmental Management Plan (CEMP) that details measures to manage dust and odour to protect the amenity of the neighbourhood.

All construction facilities at the site will be designed and operated to minimise the emission of smoke, dust, cement dust, plant and vehicle exhausts, and other substances into the atmosphere. Construction methods will be used that minimise air pollution.

Dust from construction works will be hosed down with water as required. Construction vehicles leaving the site will cover their loads and will be washed down to prevent tracking dust and mud from the site. Power tools will be fitted with dust collection devices where practical.

In compliance with Development condition E13, should outdoor lighting result in any residual impacts on the amenity of surrounding sensitive receivers, SINSW will provide mitigation measures in consultation with affected landowners to reduce the impacts to an acceptable level. Visual amenity impacts will be limited during construction via the installation of appropriate site fencing and adherence to site housekeeping procedures.

7.4. Flora and fauna

SINSW is committed to ensuring construction work has a minimal impact upon fauna and vegetation on site.
SINSW will comply with all Development Consent Conditions relating to the protection of fauna and vegetation and all relevant mitigation measures listed in the project's Environmental Impact Statement (EIS).

The project's CEMP details the measures to be taken for the protection and management of fauna and vegetation, and has been prepared in accordance with relevant guidelines and performance indicators.

Trees will not be trimmed or removed without appropriate statutory approval. A qualified and experienced arborist will complete all vegetation removal and trimming.

Trees and vegetation that must be preserved will be fenced-off, marked or otherwise isolated to ensure they are not inadvertently damaged as per the recommendations of the Arborist Report Rev A, dated 27 September 2023 and Addendum to Arborist Report dated 30 November 2023 and prepared by Joseph Pidutti Consulting Arborist.

Any trenching or construction works unavoidably undertaken within Tree Protection Zones will be witnessed, supervised and recorded by an AQ5 qualified arborist who will specify any works to be undertaken to avoid or remediate damage to trees.

On completion of the works, all areas disturbed by construction activities shall be restored to the contract specifications. Where required and practical, efforts will be made to mulch and re-use vegetation on site or send it to a green waste recycling facility.

7.5. Soil and water

SINSW is committed to the appropriate management of soil and water on the construction site. SINSW will comply with all Development Consent Conditions relating to soil and water management and will comply with all relevant mitigation measures listed in the Environmental Impact Statement (EIS).

The CEMP for the project includes a Construction Soil and Water Management Sub-Plan (CSWMSP) which details measures for the management of soil and water. It has been prepared in accordance with relevant guidelines and performance indicators. The CSWMSP:

- describes erosion and sediment control measures to be implemented during construction
- provides a plan of how construction works will be managed in wet-weather events
- details flows from the site to surrounding area
- describes the measures to be taken to manage stormwater and flood flows for small and large sized events.

Erosion and sediment controls will be installed and maintained in accordance with the “Blue Book” – Managing Urban Stormwater: Soils and Construction (4th edition). These controls will be implemented prior to the start of any other site disturbance works.

Care will be taken to prevent sediment run-off into neighbouring lots and stormwater systems. This includes installing silt fences to site boundaries, as required, and fixing geotextile fabric to the temporary construction fencing for any downhill boundaries. Stormwater inlets will be covered with geotextile fabric to ensure no sediment enters the system.
Vehicle access will be controlled to prevent sediment being tracked. An all-weather driveway to access the site will be maintained.

Only approved soil and imported fill types will be used onsite in accordance with the consent conditions. Accurate records will be kept on the volume and type of fill used onsite. Any collected silt will be disposed of in accordance with the relevant codes and standards.

Regular inspections, repairs and cleaning will be carried out of the silt fences to the boundaries, stockpiles, wastes enclosers and of the stockpile covers.